# National Emission Standards for Hazardous Air Pollutants (NESHAP) FOR Lime Manufacturing Background Information Document - Vol II

## PUBLIC COMMENTS AND RESPONSES

August 2003

Emission Standards Division

U.S. Environmental Protection Agency
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

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# 1.0 SUMMARY

On December 20, 2002, the U.S. Environmental Protection Agency (EPA) proposed national emission standards for hazardous air pollutant (HAP) emissions from lime manufacturing plants located at major source facilities (67 FR 78046). These proposed standards implemented section 112(d) of the Clean Air Act as amended in 1990 (CAA). There were 24 comment letters on the proposal (see Table 1-1), and the commenters consisted of trade associations, manufacturers, and engineering firms, and the general public. Summaries of the comments, and the EPA's responses, are presented in this background information document (BID Volume II). This summary of comments and responses served as the basis for the revisions made to the rule between proposal and promulgation. Besides summarizing the comments and responses, this document also presents a summary of the rule revisions. This document supplements the information used to develop the proposed rule, which is the docket for this rulemaking.

## Table 1-1 List of Commenters

## (See Docket No. OAR-2002-0052 and Docket A-95-41 -National Emission Standards for Hazardous Air Pollutants for Lime Manufacturing Plants for the comments)

| Document Number | Date Rcvd in Docket | Cementer, Addressee, Title or Description, etc. | Date of Document |
|---|---|---|---|
| IV-D-01 | 02-13-03 | John S. Morawetz, Center Director, ICWUC Center for Worker Health and Safety Education, Cincinnati, OH. | 02-14-03 |
| IV-D-02 | 02-18-03 | A. J. Paris, President, Huron Lime Inc. | 02-14-03 |
| IV-D-03 | 02-18-03 | William M. Brant, Director, Miami-Dade Water and Sewer Department, Miami, FL. | 02-18-03 |
| IV-D-04 | 02-18-03 | Arline M. Seeger, Executive Director, National Lime Association, Arlington, VA. | 02-18-03 |
| IV-D-05 | 02-18-03 | Tony C. Panchyshyn, Senior Environmental Engineer, Graymont Western US Inc., Salt Lake City, UT. | 02-14-03 |
| IV-D-06 | 02-18-03 | J. Oscar Robinson, General Partner, Austin White Lime Co., Austin, TX. | 02-16-03 |
| IV-D-07 | 02-18-03 | Dana Stone, Vice President, Operations, Cutler-Magner Company, Duluth, MN. | 02-13-03 |
| IV-D-08 | 02-18-03 | Harold W. Robbins, President, Bison Engineering Inc., Helena, MT. | 02-14-03 |
| IV-D-09 | 02-18-03 | James R. Carson, Senior Staff Engineer, Environmental Affairs, Ispat Inland Inc., East Chicago, IN. | 02-17-03 |
| IV-D-10 | 02-18-03 | Jeffrey P. LaCosse, President and Principal Scientist, Spectral Insights LLC, Durham, NC. | 02-17-03 |
| IV-D-11 | 02-18-03 | Steve Raffensperger, Vice President-General Manager, MidAmerica Division, Martin Marietta Aggregates, Mason, OH. | 02-17-03 |
| IV-D-12 | 02-18-03 | Lucie Macalister, Environmental Engineer, Linwood Mining and Minerals Corp., Davenport, IA. | 02-14-03 |

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|---|---|---|---|
| IV-D-13 | 02-18-03 | Robert J. Bartosh, Senior Vice President & COO, Dakota Coal Company, Bismarck, ND. | 02-13-03 |
| IV-D-14 | 02-18-03 | Louis Wolfe, Private Citizen, Newark, DE. | 02-15-03 |
| IV-D-15 | 02-18-03 | Stephen A. Loeschner, Private Citizen, Fort Wayne, IN. | 02-18-03 |
| IV-D-16 | 02-18-03 | Ron Downey, Director, Environmental Compliance, LWB Refractories, York, PA. | 02-18-03 |
| IV-D-17 | 02-18-03 | Darin Klewsaat, Assistant Operations Director, Southern Lime Company, Calera, AL. | 02-21-03 |
| IV-D-18 | 02-11-03 | Lecia Craft, Vice President of Environment, Pete Lien & Sons Inc., Rapid City, SD. | 02-11-03 |
| IV-D-19 | 02-10-03 | Craig Clapsaddle, Mechanical Systems Inc. (MSI), Raleigh, NC. | 02-10-03 |
| IV-D-20 | 02-17-03 | Fred Nast, Chief Executive Officer, Western Lime, West Bend, WI. | 02-17-03 |
| IV-D-21 | 02-18-03 | Spencer C. Stinson, General Manager, Global Stone Chemstone Corp., Strasburg, VA. | 02-18-03 |
| IV-D-22 | 02-17-03 | Johnney G. Bowers, Vice President, Manufacturing, United States Lime & Minerals Inc., Dallas, TX. | 02-12-03 |
| IV-D-23 | 02-15-03 | Comment entitled " CLEAN AIR IS ESSENTIAL." submitted by JeanPublic@yahoo.com. | 02-15-03 |
| IV-G-01 | 02-24-03 | J. Steven Castleberry, Environmental Affairs Manager, Mississippi Lime, Alton, IL. **(This document contains Confidential Business Information. Please contact the project officer if you need to review.)** | 02-18-03 |

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**(See Docket No. OAR-2002-0052 and Docket A-95-41 -National Emission Standards for Hazardous Air Pollutants for Lime Manufacturing Plants for the comments)**

# 2.0 Rule Changes Since Proposal

## 2.1 Emission Limits

We proposed a particulate matter (PM) standard (as a surrogate for non-mercury hazardous air pollutant [HAP] metals) of 0.12 pounds PM per ton stone feed (lb/tsf) reflecting the performance of dry pollution control systems (baghouses). We also solicited comment on having a separate PM standard of 0.60 lb/tsf for kilns controlled with wet scrubbers. In the final rule, we have decided to adopt these two different standards for PM emissions from existing lime kilns. We are also indicating that existing kilns subject to the 0.60 lb/tsf PM emission limit are not to be included in any averaging scheme for demonstrating compliance with a PM standard.

## 2.2 Monitoring Requirements

In the proposed NESHAP, we required facilities using wet scrubbers to monitor scrubber pressure drop and liquid flow rate. We have written the final NESHAP to explicitly state that alternative monitoring procedures are allowed under the procedures described in 40 CFR 63.8(f). However, we do not delegate that authority.

The proposed NESHAP stated that you must install, operate, and maintain a continuous opacity monitoring system (COMS) as required by 40 CFR part 63, subpart A, General Provisions, and according to PS-1 in Appendix B to 40 CFR part 60. We have stated in the rule that COMS installed, relocated, or substantially refurbished after February 6, 2001, must meet the requirements of PS-1 as revised on August 10, 2000. Any COMS installed on or before February 6, 2001, should continue to meet the requirements in effect at the time of installation unless specifically required by the local regulatory agency to re-certify the COMS in question.

In the proposed NESHAP, we required you to monitor the performance of fabric filters (FF) with either a COMS or a PM detector. In the final NESHAP, we are allowing existing facilities to monitor FF performance using daily EPA Method 9, in Appendix A to 40 CFR part 60, visible emission readings if the facility has a positive pressure FF with multiple stacks, or if it is infeasible to install a COMS in accordance with PS-1 in Appendix B to 40 CFR part 60.

In the proposed NESHAP, we allowed three alternatives for monitoring electrostatic precipitator (ESP) performance. These were a COMS, a PM detector, or monitoring ESP voltage and current. In the final NESHAP, we are allowing only two alternatives, a COMS or a PM detector. There are no requirements to establish ESP voltage and current operating limits.

In the proposed NESHAP, we specified that EPA Method 9 in Appendix A to 40 CFR part 60 should be used to determine opacity from fugitive emissions. We have retained this requirement in the final NESHAP, but we have added additional requirements on how EPA method 9 in Appendix A to 40 CFR part 60 should be implemented to determine fugitive visible emissions. This language was taken directly from 40 CFR 60.675(c)(1).

In the proposed NESHAP, §63.7120(b) could be interpreted to imply that processed stone handling (PSH) operations must be continuously monitored. In the final NESHAP, PSH operations are subject to monthly (not continuous) visible emission testing.

## 2.3 Emission Testing and Reports

In the proposed NESHAP, we required that lime kiln emission testing be conducted at the highest production level reasonably expected to occur. In the final NESHAP, we require that lime kilns be tested under representative operating conditions.

In the proposed NESHAP, we required reporting of deviations from operating, visible emissions, and opacity limits, including those deviations that occur during periods of startup, shutdown, or malfunction. In the final NESHAP, we require that reports are to be made in accordance with 40 CFR 63.10(d).

In the proposed NESHAP, we required testing of all kilns in order to claim area source status. In the final NESHAP, we have included a provision that allows the permitting authority to determine if idled kilns must be tested, and also to determine whether all kilns that use identical feed materials, fuels, and emission controls must still all be tested.

## 2.4 Applicability

In the proposed NESHAP, the raw material storage bin was the first emission unit in the sequence of lime manufacturing that was part of the affected source. Materials processing operations between the storage bin and the kiln were also covered. In the final NESHAP, material stockpiles prior to the processed stone storage bin are not covered, open processed stone piles are not covered, storage bins are defined as manmade enclosures, and use the term processed stone handling operations instead of materials processing operations.

In the proposed NESHAP, we included as an affected source lime kilns that produced lime product from any calcareous substance. In the final NESHAP, we have excluded lime kilns that produce lime from water softening sludge that contain calcium carbonate.

In the proposed NESHAP, we excluded materials handling operations associated with lime product. In the final NESHAP, we have specifically stated that nuisance dust collectors are part of lime product handling systems and, therefore, are not part of the affected source.

In the proposed NESHAP, we defined the affected source as the collection of all of the lime kilns, lime coolers and materials processing operations. We noted that this language could be misinterpreted to imply that a new lime kiln erected at an existing lime manufacturing plant would be considered existing, not new. In the final NESHAP, we have written the language in 40 CFR

63.7082 to make our intent clear. New lime kilns, whether or not they are built at an existing lime manufacturing plant, must meet the PM emission limits for new sources.

## 2.5 Averaging Periods for Monitoring

In the proposed NESHAP, we required that facilities use rolling 3-hour averages to show compliance with wet scrubber operating limits. We noted that in the proposed rule, we did not clearly state how to calculate the rolling average. Based on compliance requirements of other NESHAP, we determined that a rolling average was not necessary to ensure compliance, but did increase the complexity of the average calculation and record keeping process. Therefore, in the final NESHAP, we require block 3-hour averages instead of rolling 3-hour averages, which is consistent with the requirement to use block averaging required for ESP that choose to monitor using COMS.

## 2.6 Averaging Kiln Emissions

In the proposed NESHAP, we allowed averaging among all lime kilns and coolers at existing sources, and all new lime kilns and coolers at new sources, but did not allow averaging of existing and new lime kilns and coolers together. In addition, the averaging provisions and equations applied whether or not the facility desired to average. We have written the final NESHAP to state that each individual new lime kiln and its associated cooler must meet a 0.10 lb/tsf PM emission limit, and each individual existing lime kilns and its associated cooler must meet a 0.12 lb/tsf PM emission limit. Averaging is optional, so that if each individual kiln meets its emission limit, averaging is not required. The exception to this is for existing kilns which are subject to the 0.60 lb/tsf PM emission limit. These kilns are not eligible for averaging.

If the lime manufacturing plant has multiple kilns and wants to average kilns together to meet the PM emission limit, this is allowed (with one limitation discussed below, and the exception for kilns subject to the 0.60 lb/tsf PM emission limit noted above) and the averaging equations in the final rule must be used. However, in no case may a new kiln exceed a 0.10 lb/tsf emission limit. Where there are both new and existing lime kilns at a facility, then the PM emission limit will be an average of the existing and new kiln PM emissions limits, weighted by the annual actual production rates of the individual kilns. We believe that allowing averaging is appropriate here because of the identity of the units (kilns and coolers in all cases), and the emissions (same HAP in same type of emissions, since all emissions result from kilns and coolers). Averaged emissions under these circumstances would, thus, still reflect MACT for the affected source. The averaging provisions are included in the final NESHAP as a result of the recommendations of the Small Business Advocacy Panel convened as required by section 609(b) of the Regulatory Flexibility Act (RFA) and improves the compliance flexibility options for small businesses, which is the intent of the RFA.

The only limitations we are requiring on averaging are: 1) any new kiln, when considered alone, must meet the 0.10 lb/tsf emission limit; 2) kilns equipped with wet scrubbers for PM emissions control are not eligible for averaging; 3) we are not allowing averaging for other emission sources, or for opacity.

## 3.0 Comment Summaries and EPA Responses

### 3.1 Subcategory for Scrubber-Equipped Kilns

#### Comment

In the preamble to the proposed rule, EPA requested comment on establishing a subcategory for existing kilns equipped with wet scrubbers, if it could be demonstrated factually that there would be significant environmentally counterproductive effects due to increased emissions of acid gases, increased energy use, or increased water use. (See 67 FR at 78058.) Several commenters (IV-D-04, IV-D-06, IV-D-02, IV-D-16, and IV-D-22) asked that a subcategory for scrubber-equipped kilns be established. One commenter ( IV-D-04) also asked that kilns vented through a mine chamber be defined as scrubber-equipped kilns. The basis for this request, in the commenters' view, is that wet scrubbers cannot meet the proposed particulate matter (PM) standard of 0.12 pounds of PM per ton solid feed (lb/tsf), and therefore kilns with scrubbers would have to replace them with baghouses. (They also assert that in most cases, wet scrubbers have higher annualized costs compared to baghouses. Therefore, even if a wet scrubber could meet a 0.12 lb/tsf emission level, facilities will opt to use baghouses due to cost considerations. See comments on costs which follow.) This will result in an increase in emissions of HCl [a hazardous air pollutant (HAP)] and $SO_2$ (a non-HAP criteria pollutant), for a nominal decrease in HAP metal emissions.

In support of this request one commenter provided estimates that not establishing the requested wet scrubber subcategory would result in a metal HAP emissions decrease of 3 tons per year (tpy), but would result in an increased emissions of 1823 tpy for HCl and 2894 tpy for $SO_{2.}$

One commenter (IV-D-12) stated that it had previously provided information on the effect of replacing wet scrubbers with baghouses. They claimed that replacing one plant's wet PM control system with a baghouse will increase HCl by over 20 tpy, but only decrease metal HAP by 481 pounds per year (Docket Item No. I-B-116, Appendix C).

Another commenter (IV-D-02) estimated that HAP currently being discharged from its three existing kilns are 29 tpy of HCl and 0.38 tpy of HAP metals. The emissions from the same kilns if dry air pollution control equipment were used would be 652 tpy of HCl and 0.075 tpy of HAP metals. They also claim that the higher operating temperatures of dry systems cause metals to vaporize and pass through a particulate collector, resulting in a lower metal concentration in the captured particulate. As a result, they claim that even though dry control equipment may reduce HAP metals emissions, the reduction will be minimal, while the release of HCl will increase significantly. In addition, the commenter notes that approximately 39 percent of the HAP metal emissions attributed to the lime industry is manganese, which is not classified as a known or suspected carcinogen. The commenter provides data which it claims show the only conventional pollutant that will be reduced with the installation of a dry control system will be particulate emissions, and, “fugitive dust emissions from a dry system could more than offset the improved particulate collection on the kiln exhausts.”

**Response**

Standards implementing section 112 (d) of the Act must, of course, be of a minimum level of stringency, usually referred to as the MACT floor. For existing sources, this floor level of control cannot be less stringent than “the average emission limitation achieved by the best performing 12 percent of the existing sources (for which the Administrator has emissions information).” In this rule, EPA is establishing section 112 (d) standards to control emissions of HAP metals, for which PM is a surrogate. None of the commenters challenge that the level of PM emissions reflecting the average of the 12 per cent of the best performing sources is 0.12 lb/tsf. Notwithstanding, the commenters contend that EPA should subcategorize on the basis of the type of air pollution control device used, and then separately determine the floor for each subcategory.

Although the Act contemplates that EPA may establish subcategories when promulgating MACT standards,[1] subcategorization typically reflects “differences in manufacturing process, emission characteristics, or technical feasibility”. See 67 FR at 78058; see also 63 FR at 18768 (April 15, 1998) determining whether or not to subcategorize based on “the type of equipment used in the process, the emission potential of each emission point, and any variations in the process due to pulp type”. A classic example, provided in the legislative history to section 112 (d), is of a different process leading to different emissions and different types of control strategies – the specific example being Soderberg and prebaked anode primary aluminum processes. [See A Legislative History of the Clean Air Act Amendments of 1990 at 1138-39 (floor debates on Conference Report)].

Normally, it would be legally impermissible to subcategorize based on the type of air pollution control device. The problem with subcategorizing on the basis of pollution control device, quite simply, is that it leads to situations where floors are established based on something other than the “best performing” sources. For example, suppose a source category consists of 100 sources using the same process and having the same emission characteristics, but that 50 sources use control device A to control HAP emissions, and 50 use control device B which is

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[1] Section 112 (d) (1) provides that "[t]he Administrator may distinguish among classes, types, and sizes of sources within a category or subcategory in establishing such standards.....". In addition, section 112 (c) (1) encourages EPA to adhere to the subcategorization scheme already used in establishing NSPS: "To the extent practicable, the categories and subcategories listed under this subsection shall be consistent with the list of source categories established pursuant to section 111 [requiring EPA to establish technology-based New Source Performance Standards] and Part C” (although the NSPS for the lime industry does not contain subcategories, nor was it ever suggested when establishing NSPS that subcategories would be appropriate).

two orders of magnitude less efficient. If one subcategorized based on the type of pollution control device, the MACT floor for the 50 sources with control device B would reflect worst, rather than "best" performance. Although the disparity in levels of emission control between the best performing sources here, and the best performing sources using wet scrubbers is not this dramatic – roughly a factor of 5, not orders of magnitude – the difference is nonetheless ample and evident.

The question of whether it is permissible to subcategorize on the basis of pollution control device has been litigated in the context of the effluent guideline provisions of the Clean Water Act. These provisions, which were the prototype of the MACT provisions in the Clean Air Act [see 5 Legislative History at 8473-74 (Senate Report)], require control of toxics reflecting performance of best technology, although the Clean Water Act gives EPA more flexibility to subcategorize than the Clean Air Act, since there is no floor provision, and EPA is required to consider manufacturing process, age, engineering aspects, costs, and types of control equipment (among other factors) in setting the standards. Clean Water Act section 304 (b). Nonetheless, the Fifth Circuit rejected the argument that EPA erred in not subcategorizing based on different types of pollution control equipment:

> [P]etitioners' plants do not differ materially from other [chemical] plants with respect to manufacturing operations or wastewater characteristics.... Their plants differ only with respect to the type of treatment petitioners voluntarily chose to employ. Petitioners did not choose to employ the type of ... treatment system that is most commonly used by good performers in the [chemical] industry .... Instead, petitioners chose to employ ... treatment systems which generate additional pollutants .... The EPA asserts that it therefore reasonably required petitioners' plants to meet the limitation demonstrated to be achievable by the 'best' plants in the industry, rather than providing less stringent limitations for these plants simply because they chose to employ less effective treatment technology....
>
> Petitioners cannot now be excused from meeting the BPT [Best Practicable Technology] limits on the grounds that their present method of treatment is less effective than the average of the best.... Such a construction of section 304 (b) (1) (B) would defeat the very purpose of establishing BPT limits. The EPA is not required to base BPT upon a technology that is less effective than the best practicable technology demonstrated in the industry....We therefore hold that the EPA was entirely reasonable in declining to create a subcategory for plants employing [the less effective] treatment systems.

Chemical Manufacturers Association v. EPA, 870 F. 2d 177, 218-19 (5th Cir. 1989) (emphasis supplied), modf'd on different grounds on rehearing, 885 F. 2d 253 (5th Cir. 1989).

This remains EPA's concern in the final rule. Subcategorizing purely on the basis of pollution control device type "would defeat the very purpose of establishing [MACT]" because such a construction would mean the MACT floor would no longer reflect the performance of best performing sources, as required.

It has been suggested here, however, that the best performing sources with respect to HAP metal emissions should not be considered “best performing” because that performance comes at an environmental cost, namely increased emissions of HCl and $SO_2$ compared to what lime kilns equipped with wet scrubbers would emit. There is some support for the idea that if an ostensibly best performing pollution control device creates potentially counterproductive environmental effects, such performance need no longer be considered “best” due to the counterproductive effects, and could justify differentiation in the form of subcategorization (See 66 FR at 3187 [January 12, 2001]). Commenters suggest that is the case here due to increased emissions of HCl and $SO_2$ which would result (they maintain) if lime kilns replace wet scrubbers with baghouses.

First, it is not clear the commenters’ starting premise, that baghouses are either needed or will be used to achieve the PM standard, is correct. We continue to believe that a properly designed and operated wet scrubber can meet the proposed PM emission limit of 0.12 lb/tsf. The reasons for this are specifically addressed in our following response to comments on achievable wet scrubber performance.

The commenters provided no data to refute that application of a 0.12 lb/tsf PM emission limit represents best control of HAP emissions if we do not create any kiln subcategories. We note that as part of their comments, they claim that the higher temperatures of dry PM controls result in metals vaporizing and passing through the PM control. However, the data provided in their comment does not substantiate their claim, and analyses performed for the Hazardous Waste Combustor NESHAP indicate that all but a few percent of the metals in question exit the kiln as solid particulate (see pages 1-1 through 1-4 in the Draft Technical Support Document for HWC MACT Standards, February 1996, which are in the docket for this rulemaking). The same comments stated that the increased PM emissions control that results from baghouses could be more than offset by increased fugitive dust emissions from dry systems. We know of no data that supports that statement. Dry dust systems can be designed and operated to minimize fugitive emissions. Moreover, we do know that fabric filters are commonly used when high levels of PM control are desired in many industries. In none of these cases do we know of any instance where less efficient wet scrubbers were applied in lieu of more efficient fabric filters due to concerns of fugitive dust emission from the collected particulate.

We also evaluated the concerns that switching to dry controls may result in increases of $SO_2$ and HCl emissions. However, our analysis indicates that the extent to which $SO_2$ and HCl emissions actually increase may have been overstated by the commenter. EPA estimates that if all facilities currently using wet scrubbers switched to dry controls, HCl emissions would increase by approximately 1,310 tpy (vs 1,800 tpy estimated by the commenter) and $SO_2$ emissions would increase by about 1,830 tpy (vs 2,900 tpy estimated by the commenter). (See the memorandum “Environmental Impacts of Decision on Best Control for Wet-Scrubber controlled Kilns” in the docket for this final rule).

We do not regard either level of increased HCl emissions as significant. We modeled this emissions increase as part of our determination (pursuant to section 112 (d) (4)) that emissions of HCl from lime kilns are below an HCl risk threshold, with an ample margin of safety. See FR 78054 - 78057 and the risk analysis in the docket for the final rule. Given this determination, we cannot view these HCl increases as being so significant as to call into question whether the best-performing sources with respect to HAP metal reductions are in fact "best performing".

The commenters also cite projected increases in the criteria pollutant $SO_2$ that may result from our decision not to subcategorize by existing control device. They did not initially address the reductions in PM emissions resulting for the decision that 0.12 lb/tsf represents best-control for scrubber equipped kilns. We estimate that nearly 1,080 tpy of additional PM would be removed if all existing kilns were to meet a standard of 0.12 lb/tsf, of which approximately 1.6 tpy are metal HAP. Although EPA may not promulgate standards for non-HAP under section 112 (d), Congress expected reductions in emissions of criteria pollutants such as PM to be a benefit of the MACT program. 5 Legislative History at 8512 (Senate Report) ("When establishing technology-based standards under this subsection, the Administrator may consider the benefits which result from control of air pollutants that are not listed but the emissions of which are, nevertheless, reduced by control technologies or practices necessary to meet the prescribed limitation [going on to give VOC reductions as an example].") In comparison to estimates of increased emissions of $SO_2$ by either the commenter or EPA, the decrease in captured PM emissions (and attendant decrease in capture of non-mercury metal HAP) if all existing kilns are not required to meet a standard of 0.12 lb/tsf is significant.

There is a further consideration, however. Based on the available size distribution data from Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume I: Stationary Point and Area Sources, 73 percent of the PM emitted directly by lime kilns is coarse PM (PM in the size range of 2.5 to 10 micrometers). Some of the $SO_2$ emitted to the atmosphere undergoes chemical reactions to form fine PM. [See generally the respective Criteria Documents for PM (EPA/600/P-95/001aF-cf. 3v, 1996) and $SO_2$ (EPA/600/8-82-029aF-cF. 3v., 1982 and addenda)]. Thus, in assessing whether some potential factor might justify a decision that kilns with dry systems are not best performing, some comparison of coarse verses fine PM emissions is needed.

If we retain a single PM emission limit of 0.12 lb/tsf for all existing kilns, total PM emissions would be reduced (compared to separate standards for kilns with wet scrubbers and dry controls) by an additional 1,080 tpy. Of that number, 630 tpy is fine PM and 450 is coarse PM. The potential amount of increased $SO_2$ emissions is 1,830 try. A portion of this 1,830 tpy of $SO_2$ will be converted in the atmosphere to produce 1,270 tpy of fine PM. Therefore, the incremental impact of a single PM standard of 0.12 lb/tsf for both wet scrubbers and dry controls would be an increase of 640 (1,270-630) tpy in fine PM emissions, and a decrease of 450 tpy in coarse PM emissions. This assumes that all facilities that currently have wet scrubbers switch to dry controls, and that 46 percent of the $SO_2$ converts to fine PM. The 46 percent conversion estimate used by the commenter is consistent with information in the respective Criteria Documents for PM and $SO_2$ referenced above.

As recently summarized by EPA (68 FR 28339, May 23, 2003), scientific studies show ambient PM (both fine and coarse) is associated with a series of adverse health effects. Fine PM is associated with increases in daily mortality. Coarse PM is more strongly linked to morbidity (e.g. hospital admissions). See generally the respective Criteria Documents for PM (EPA/600/P-95/001aF-cF. 3v, 1996) and $SO_2$ (EPA/600/8-82-029aF-cF. 3v., 1982 and addenda). Therefore, it is difficult to make comparisons between the relative benefits of reducing emissions of fine and coarse PM.

We view this situation as equivocal: it is unclear which of these types of performance is best since on the one hand there is reduced emissions of HAP metals and coarse PM but foregone control of $SO_2$ and sulfate (fine) PM, and, for kilns controlled with wet systems, the converse. In this situation, and based on these facts, which, with current analytic tools seem to us to be largely in equipoise, we are not prepared to view either wet or dry systems as best performing and instead are promulgating a separate PM standard for each.

We emphasize that considerations of risk and relative environmental benefits are normally irrelevant to MACT floor determinations [unless expressly authorized by statute, as in Clean Air Act (CAA) section 112(d)(4) as applied in the final rule], since floor standards must reflect the performance of the specified number of best performing sources. See National Lime Ass'n v. EPA, 233 F. 3d at 640 (considerations of cost and de minimis risk cannot be considered in making MACT floor determinations). We considered these factors in the final rule solely for the purpose of evaluating the commenters' claim that sources using wet and dry control systems should be evaluated separately for MACT floor purposes due to environmental benefits and disbenefits associated with wet and dry control systems. Given the equivocal facts here, we are not prepared to state that either the wet or dry systems are "best performing" for existing kilns, and are instead promulgating separate PM standards (as a surrogate for non-mercury HAP metals) for each.

**Comment**

Commenter IV-D-04 stated that wet scrubbers cannot meet the proposed PM emission limit of 0.12 lb/tsf. They claimed that a wet scrubber manufacturer will only guarantee this limit if less than 1 percent of the particles to be removed are less than 1 micrometer in diameter. The commenter stated that EPA assumes that the average mass diameter of particles in lime kiln gas effluent is 2 micrometers, and that this assumption is based on a single reference, and that reference was actually fugitive lime dust, not lime kiln particulate. They further claimed that volatilization and homogenous nucleation of potassium chloride particles in the gas stream generates particles in the 0.1 to 0.5 micrometers size range. "As particle size decreases below 1 micrometer, inertial compaction becomes decreasingly effective. Above 0.1 micrometers, Brownian displacement is ineffective. In the range between 0.1 and 0.5 micrometers, neither of these two main particle capture mechanisms relied upon in wet scrubber design is very effective." The commenter presents a recent example of a scrubber installation and an analysis of Docket item No. II-B-126 (an EPA memo titled "Technical Feasibility of Venturi Scrubbers in Meeting 0.12 lb/ton Outlet PM Level") to demonstrate this point.

Commenter IV-D-02 claimed that a scrubber performance efficiency of 99.9 percent will be required to meet the 0.0072 grain/dry standard cubic foot (gr/dscf) particulate concentration which they claimed corresponds to the proposed PM emission limit of 0.12 lb/tsf. The commenter's environmental consultant advised that it is unlikely a wet scrubber with a 35-inch water gauge (w.g.) pressure drop could achieve this level of performance with the facility's current inlet exhaust particulate loading.

**Response**

We continue to believe that a properly designed and operated venturi wet scrubber with a 35 inch w.g. pressure drop can achieve the proposed PM emission limit of 0.12 lb/tsf. The commenter argues that EPA's basis for a 35 inch w.g. scrubber pressure drop to obtain 99.94 percent efficiency is not realistic. They base their arguments on perceived improper use of estimation procedures, incorrect choice of typical particle size, faulty vendor estimates, and lack of knowledge regarding measurements of an existing scrubber in Virginia.

This commenter misunderstands the manner in which EPA evaluated venturi scrubber performance. The particle size data used in the preliminary estimate came from several sources, not one as suggested by the commenter. Second, of the various data available, we chose the data on fugitive lime dust PM because they had the smallest mean particle size diameter, which was 2 micrometers. This was a very conservative assumption, because, for a normal particle size distribution, the wet scrubber pressure drop required to meet a specific removal efficiency increases as the mean particle size decreases. All the other data presented in our analysis indicates that the mean particle size for lime kiln particulate is much larger than the 2 micrometers we chose. For example, the particle size data reported in EPA's AP-42, Section 11.15, Lime Manufacturing, indicate that the mean particle size for uncontrolled kilns is over 15 micrometers.

We used this atypically small particle size as a median diameter to input into simplified methods to estimate the pressure drop required to meet a scrubber PM removal efficiency of 99.94 percent (the removal efficiency required to meet a 0.12 lb/tsf PM emission limit).

The first commenter also asserted that the pressure drop estimation procedure we used is inappropriate. The commenter stated that in determining the required wet scrubber pressure drop in a particular application, the particulate must be assigned to a set of discrete size ranges and the scrubber efficiency evaluated at a specific pressure drop size range by size range. These results must then be used to calculate the overall PM removal efficiency.

We agree that, if data are available, the procedure described above is more accurate. However, we note that the commenter did not provide any particle size data that would either substantiate the contentions, or allow us to use the procedure claimed to be more accurate. In the absence of the type of data described by the commenter, the conservative and simplified approach to estimating wet scrubber pressure drop used here, that is, using a conservative estimate of median particle size, is reasonable. Therefore, based on the data available, the procedure we have used to estimate what scrubber pressure drop, on average, will be necessary to meet a 0.12 lb/tsf PM emission limit, is sufficiently accurate. As explained, this procedure results in an estimate that a 35-inch w.g. pressure drop is needed.

However, as a check, we also contacted wet scrubber vendors to provide more rigorous estimates to confirm whether the 35-inch w.g. pressure drop value was valid. One vendor, using proprietary data, estimated a 35-inch w.g. pressure drop was sufficient provided there is sufficient moisture in the gas stream ahead of the venturi throat to increase particle size so that the venturi scrubber can remove the PM. We believe that the fact that two independent estimates produced the same result verifies our estimation procedure.

If necessary, cooling water can be added prior to the venturi in order to sufficiently increase particle size. In some cases, more water can be added through a packed bed. Note that the cooled gas stream would have lower gas volume resulting in smaller fan, motor, and duct requirements.[2]

This same commenter presented data from a wet scrubber controlled calcimatic lime kiln indicating that potassium chloride in limestone leads to generation of a significant quantity of particles in the 0.1 to 0.3 micrometer range, which are difficult to collect in a wet scrubber. This wet scrubber was designed for an outlet concentration of 0.01 gr/dscf at a pressure drop of 22 inches w.g., but, after modifications, could only reach about 0.04 gr/dscf. The commenter asserted that it is "often the case" that 10 percent of the inlet loading to a lime kiln scrubber is in the 0.1 to 0.3 micrometer range. The commenter later provided data they claim supports this statement. The commenter cited this example to call into question EPA's conclusion that a wet scrubber with a pressure drop of 35 inches of water can meet a 0.12 lb/tsf PM emission limit.

First, and most important, the example cited by the commenter can in no way be used to make generalized industry-wide conclusions about the ability of wet scrubbers to meet a 0.12 lb/tsf PM emission limit. The commenter did not include in their comments information from a BACT analysis for the Global facility (Global Chemstone Corporation, March 15, 2002) written by the same person who wrote the commenter's statement regarding pressure drop and particle size. This BACT analysis states that the calcimatic kiln being controlled has different characteristics than the more conventionally found rotary kiln. Statements about the scrubber

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[2] Packed beds were not specifically costed out in our model kilns, but the additional cost for the packed bed (if ever needed) would be offset by the reduced cost of the fan, motor, and ductwork as well as reduced annual cost for power that result from the effect of gas cooling which reduces gas volume. However, some plants could possibly upgrade their existing scrubber for about 40 percent of the cost of a new wet scrubber. In these cases, our model plant costs overstate capital cost by about 150 percent. On a nationwide basis, our scrubber costs probably overstate what actual costs are likely to be.

and kiln indicate that they present a unique case, not likely to be found at other lime kiln sites. Examples are,

- "... the existing total filterable particulate matter emission limit of 0.022 grains/dry standard cubic foot is too low given the unique issues associated with operating a calcimatic kiln with a moderate-to-high potassium content limestone feed [363 parts per million (ppm)]." (p.1 of the analysis)

- "Global has a Calcimatic lime kiln, which is fundamentally different from a traditional rotary lime kiln." (p. 2 of the analysis)

- "However, there are significant differences between a rotary lime kiln and calcimatic lime kiln." (p. 5 of the analysis)

- "The dominant characteristic of rotary lime kilns is the high concentration of particulate matter entrained in the gas stream due to the direct contact of the hot flue gas with the tumbling feed materials within the kiln. This particulate matter provides the surface area necessary for the condensation (heterogeneous nucleation) of vapor phase materials. Potassium and other vapor phase materials in the kiln gas stream will concentrate primarily in moderate-to-large particulate matter that can be controlled with high efficiency wet scrubber systems." (p. 5 of the analysis)

- "... the particulate matter loadings from a calcimatic kiln are lower than those of a rotary kiln. Due to the low particulate matter concentrations in the calcimatic kiln effluent gas streams, a significant fraction of the vapor phase potassium and other vapor phase material can condense (homogeneously nucleate) to form submicrometer sized particles after the gas stream exits the kiln. Therefore, emission figures based on rotary kiln control equipment are not relevant to calcimatic lime kilns." (p. 6 of the analysis)

- "... a reverse air fabric filter with membrane bags is technically infeasible at Global. The problems inherently involved with submicrometer sized potassium chloride also preclude the use of (1) reverse air fabric filters with conventional woven filter media and (2) pulse jet fabric filters with membrane-coated felted bags." (p, 8 of the analysis, note that fabric filters have been used to control lime kilns for decades)

- "The Calcimatic kiln is more vulnerable to homogeneous nucleation than rotary lime kilns due to the low particulate matter concentrations in the Calcimatic kiln effluent gas stream." (p. 11 of the analysis).

Based on these comments, it is clear that the situation at the Global Stone Chemstone facility is unique, and not applicable to the industry as a whole.

However, the information presented here could be used to imply that wet scrubbers are not as effective on calcimatic kilns as on to rotary kilns. (Note that calcimatic kilns make up only about 6 percent of the currently operating lime kilns). However, as we have never claimed that a wet scrubber with a 22 inch w.g. pressure drop can meet the proposed PM emission limit of 0.12 lb/tsf (as explained above, we estimated that a 35 inch w.g. pressure drop will be necessary), we do not see how the example cited by the commenter is relevant. Also, given the fact that the particle size data appear to have been collected after the scrubber was installed, we conclude that that there are certain site specific factors that were not accounted for in the scrubber design.

However, this commenter goes on to claim that the wet scrubber in question could not meet a PM emission limit of 0.12 lb/tsf even if the pressure drop were increased to 35 inches. They claimed this is because of the presence of a large amount of particles in the 0.1 to 0.5 micrometer size range at this particular facility, and that particles in this size range are the most difficult to collect with a wet scrubber. However, it should still be possible to meet 0.12 lb/tsf even in this case, though additional costs for water injection or for steam injection (to provide additional moisture in the exhaust gas) may be required. In that case, if a facility was required to meet a 0.12 lb/tsf PM emission limit, it might opt for a fabric filter. Our model plant costing does not purport to predict how any individual kiln might react. Finally, based on our determination that facilities that currently have wet scrubbers meeting 0.6 lb/tsf are environmentally equivalent to dry controls meeting 0.12 lb/tsf, the fact that this facility claimed it cannot meet 0.12 lb/tsf is moot.

Another point made by this commenter concerned the choice of gas flow rate used for scrubber-equipped kiln modeling. From Information Collection Request (ICR) data available to EPA, exhaust gas flow rates for scrubber-equipped kilns were found to vary from about 100,000 actual cubic feet per minute (acfm)/ton of lime to about 310,000 acfm/ton of lime. The EPA chose an intermediate value of 165,000 acfm/ton of lime for modeling purposes (see docket item II-B-14). There was no intent to choose either the lowest or the highest flow rate in the database because on average, an intermediate value would be more representative. This commenter also stated that the value of the PM concentration in the flue gas was incorrect because we did not account for the water vapor from evaporation in the scrubber, and used a 800°F flue gas temperature. The concentration calculation was used to define inlet conditions to the model scrubber so that scrubber sizing and water requirements could be estimated by a vendor. The estimated PM concentration was not used in determining scrubber pressure drops, or in estimating costs.

The second commenter supplied no data to support the assertion by their consultant that a 35-inch w.g. pressure drop scrubber could not achieve the required efficiency. Our responses above also address their comment.

**Comment**

Commenter IV-D-04 provided an analysis of wet scrubber feasibility prepared by a consultant to supplement their summarized comment above. This analysis raised several additional points not included in our previous comment response. These are as follows:

- It took issue with the statement in Docket item No. II-B-126 “Scrubbers have been reported to collect submicron particles as low as 0.006 grains per dry standard cubic foot in EPA’s Handbook of Control Technologies for Hazardous Air Pollutants. The commenter pointed out that this statement concerned hydrosonic scrubbers.
- It claimed the calculated PM concentration at the scrubber outlet equivalent to 0.12 lb/tsf was incorrect.
- The inlet mass loading data are limited.
- The static pressure drop estimate is not applicable to bimodal distributions common to lime kilns.

**Response**

The commenter correctly points out that the statement above related to hydrosonic scrubbers. However, this statement was only intended as an introductory statement in the memo. We based our analysis on our estimation of the performance of venturi scrubbers. Therefore, the comment, though correct, is irrelevant.

The calculated PM concentration was not used to estimate the required scrubber efficiency. The required scrubber efficiency was estimated based on mass emission rates. Therefore, the concentration value has no relevance to our estimate of the scrubber pressure drop required to meet a PM emission limit of 0.12 lb/tsf.

We agree that the inlet loading PM data are limited. However, we believe that we have chosen a conservative value. We note that this commenter provided data elsewhere in their comments that indicated our estimate of 160 to 175 lb/tsf may be very conservative.

The commenter did not provide any data to support the statement that the particle size distribution from lime kilns is bimodal in the size range of 0.1 to 0.5 microns. The aerodynamic particle sizing information from the scrubber at the Virginia site does not cover the range below 0.5 microns. Apparently the commenter is basing the statement that the particle size distribution is bimodal on data from wet-scrubber controlled lime kilns with high sodium feed rates in the pulp and paper industry. However, there are no data that substantiate the commenter’s statements for either calcimatic lime kilns, such as the kiln in Virginia, or for rotary lime kilns not in the pulp and paper industry, which make up the bulk of the kiln population.

## Comment

Commenter IV-D-04 contends that EPA asserts incorrectly that lime plants will choose high efficiency venturi scrubbers to replace their current wet scrubbers because high efficiency venturi scrubbers have lower capital costs and sometimes lower annual costs than baghouses. They further stated that, according to Docket Item No. II-F-7, five of the six model kilns the Agency examined had much higher annualized costs for high efficiency venturi scrubbers than for baghouses. This commenter submitted a manufacturer's cost proposal that shows a scrubber with a 35-inch w.g. pressure drop costs substantially more than EPA estimates. They conclude from this that lime kilns will be forced to use baghouses, with attendant increases in HCl and $SO_2$ emissions. Another commenter (IV-D-22) stated that the cost for the installation of a baghouse will be greater than EPA estimated due to the location of existing equipment in the area where the collector should be located, construction of the duct collector in a congested area with plant operations, and accessibility to existing lime kiln dust handling systems.

Commenter IV-D-22 commented that the cost for the installation of a baghouse will be more costly than EPA estimated due to the location of existing equipment in the area where the collector should be located, construction of the duct collector in a congested area with plant operations, and accessibility to existing lime kiln dust handling systems.

## Response

Regarding modeled high costs for scrubbers compared to baghouses, individual models may show this characteristic. However, the distribution of kiln sizes in the lime industry and the allocation of model plants to those kilns show that estimated nationwide costs for installing venturi scrubbers is about the same as for installing baghouses. Tables 1 and 2 illustrate this condition.

In all cases, the estimated capital cost for each model scrubber is less than its corresponding model baghouse. Five of the nine models have estimated annual scrubber costs that exceed the annual baghouse costs by amounts ranging from 4 percent to 75 percent. However, when model costs are converted to national costs based on kiln type and size, the tables show a lower estimated total annual cost for upgrades with venturi scrubbers than for upgrades with baghouses. For both types of control system, costs for any specific plant may be more or less than the value shown by the model used to estimate nationwide cost. The plant is expected to buy whatever system its management believes is in the best business interests of the owners, but in the aggregate, the tables indicate that estimated annual cost for control systems is lower if all plants replace existing equipment with venturi scrubbers rather than baghouses. However, based on the specific model kiln costs, we still find that at least some kilns would replace wet systems with dry if required to meet a uniform PM emissions limit of 0.12 lb/tsf.

We developed these model plants based on actual facility data from the industry responses to questionnaires. Our model plants cover the various types of kilns currently in service, and a range of sizes of facilities. Other than the comment on gas flow rates previously addressed, we received no comments that the model kilns are not representative of the industry. The model plant parameters are generally based on the mid-range of the characteristics of the segment of the existing kiln population that they are designed to represent. Because they are based on mid-range values, comparing them to actual costs at any one specific kilns may result in a higher or lower cost estimate. However, there is no reasonable way to model every individual kiln or account for every site-specific factor. Using model kilns based on mid-range values provides an accurate estimate of the nationwide costs, even if costs for some sites may deviate from the modeled estimates.

Regarding a cost proposal substantially higher than EPA's estimate for a scrubber with 35-inch w.g. pressure drop, it is expected that some proposals will have higher costs, and some lower, than costs estimated by EPA's methodology. The methodology is based on estimates of basic equipment costs, and factors to calculate direct and indirect capital costs that constitute total capital investment. Unit costs are applied to labor, utilities, waste disposal, and other operating and maintenance costs to obtain direct annual costs. Indirect annualized costs based on capital recovery and other service charges are also estimated and added to direct annual costs to obtain total annual cost. The methodology is explained in the EPA Air Pollution Control Cost Manual. For establishing projected control costs in the lime industry, the methodology was applied to model plants having characteristics based on industry responses to questionnaires. These model estimates account for all of the components needed to build and operate a wet scrubber. However, the specific cost of any one component in our models, which are based on industry averages, may be different from those for a specific plant. Overall, our model plant approach still provides a reasonable estimate on which to base regulatory decisions.

The previous response also applies to the comment regarding installation of a fabric filter that is projected to cost more than the model cost obtained by EPA. The cost estimation methodology for lime plants contains factors that account for demolition and salvage of existing equipment that will have to be replaced by the new control system. A retrofit factor is also included to account for difficulties in replacing existing equipment with new equipment in an existing plant. As stated in the previous paragraph, estimates made with model plants will not address each specific case found in industry. However, nationwide costs are reasonably estimated, and small business concerns, where they may appear, are addressed within the regulation.

**Table 1. Cost to Upgrade Existing Kilns Equipped with Wet Scrubbers to Venturi Scrubbers**

| Model kiln | No. of kilns w/ ws* | Model Kiln Capital Cost ($1000/kiln)* | Model Kiln Annual Cost ($1000/kiln)* | Total Capital Cost ($1000) | Total Annual Cost ($1000) |
|---|---|---|---|---|---|
| A | 4 | 252 | 113 | 1,008 | 452 |
| B | 5 | 288 | 131 | 1,440 | 655 |
| C | 14 | 520 | 293 | 7,280 | 4,102 |
| D | 11 | 663 | 403 | 7,293 | 4,433 |
| G | 1 | 301 | 146 | 301 | 146 |
| H | 1 | 499 | 278 | 499 | 278 |
| I | 0 | 682 | 420 | 0 | 0 |
| L | 1 | 351 | 180 | 351 | 180 |
| M | 4 | 177 | 64 | 708 | 256 |
| Preliminary Total | 41 | | | 18,880 | 10,502 |
| **TOTAL** (assuming 70% are major sources and 90% of scrubbers will upgrade) | | | | **11,894** | **6,616** |

*Source: Economic Impact Analysis for the Lime Manufacturing MACT Standard, II-A-44.

**Table 2. Cost to Upgrade Existing Kilns Equipped with Wet Scrubbers to Baghouses (w/ water sprays)**

| Model kiln | No. of kilns w/ ws* | Model Kiln Capital Cost ($1000/kiln)* | Model Kiln Annual Cost ($1000/kiln)* | Total Capital Cost ($1000) | Total Annual Cost ($1000) |
|---|---|---|---|---|---|
| A* | 4 | 790 | 204 | 3,160 | 816 |
| B | 5 | 859 | 225 | 4,295 | 1,125 |
| C | 14 | 1488 | 274 | 20,832 | 3,836 |
| D | 11 | 2824 | 386 | 31,064 | 4,246 |
| G | 1 | 558 | 90 | 558 | 90 |
| H | 1 | 984 | 71 | 984 | 71 |
| I | 0 | 2395 | 131 | 0 | 0 |
| L* | 1 | 665 | 237 | 665 | 210 |
| M* | 4 | 569 | 197 | 2,276 | 788 |
| Preliminary Total | 41 | | | 63,834 | 11,182 |
| **TOTAL** (assuming 70% are major sources and 90% of scrubbers will upgrade) | | | | **40,215** | **7,045** |

* Model plant costs for models A, L, and M are the cost of baghouses plus cost of water injection (see II-B-111).

**Comment**

Several commenters (IV-D-04, IV-D-06, and IV-D-12) stated that not establishing a subcategory for scrubber-equipped kilns will adversely affect small businesses. Commenter IV-D-04 states the annualized cost of upgrading all scrubbers is $9.45 million, based on the distribution of kilns and EPA's estimate of total annualized costs in Docket Item No. II-B-127. According to the commenter, EPA predicts that upgrading these kilns will reduce HAP metals by 3.1 tpy, resulting in a cost effectiveness of $3.0 million/ton of metal HAP. The commenter stated that EPA's assumption that 30 percent of lime plants are area sources and won't be affected by the rule reduces the removal of metal HAP's attributed to upgrading scrubber-equipped kilns to 2.2 tpy (although the commenter stated that EPA has provided no support for the assumption that 30 percent of lime plants are area sources).

Commenter IV-D-12 notes that EPA's estimated annualized cost for the commenter to install baghouses is $2,236,000, which equates to $9.3 million per ton of particulate HAP control.

**Response**

The comments state that requiring kilns currently controlled by wet scrubbers to meet the proposed 0.12 lb. tsf PM emission limit is too costly considering the environmental benefits. However, section 112 of the Clean Air Act precludes us from considering cost when calculating MACT floors. Therefore, none of the cost issues discussed above are sufficient to support a separate subcategory for existing kilns with wet scrubbers. The commenters point to no process or other difference which would prevent them from achieving the level of performance attainable by the average of the best performing existing sources, nor suggest that those best performing sources are unrepresentative of other kilns in terms of process, baseline emissions, or other factors which traditionally would justify a separate subcategory.

Though costs cannot not be a consideration here, our estimate shows a cost of $7.15 million to upgrade all scrubbers, versus the $9.45 million figure provided by the commenter. Our estimate assumes 70 percent of kilns are located at major sources and 90 percent of scrubbers will require an upgrade.

We also note that, in addition to decreasing the emissions of HAP metals, significant PM emission reductions will result from upgrading existing scrubbers. Upgrading the existing scrubber equipped kilns will reduce PM emissions by approximately 1,300 tons/year for an approximate cost effectiveness of $5,500/ton of PM. The cost per ton of reduction is reasonable compared to other PM control regulations recently promulgated or proposed (such as the non-road diesel engine rule). We acknowledge that, in individual cases, costs and cost effectiveness will vary and in some cases be higher or lower depending on individual circumstances.

In addition, in our cost analysis, we assumed that 90 percent of existing scrubbers would be replaced, and included all the capital cost of replacement in the cost of the final rule. This is probably an overly conservative way of estimating costs. In reality, it is reasonable to assume that, on average, the existing scrubbers have only 50 percent of their useful life remaining. Because we allocated all of the capital cost of a new scrubber to the cost of the rule, our costs are conservative.

**Comment**

One commenter (IV-D-21) objects to EPA's rationale of using PM as a surrogate for controlling toxic emissions. The commenter states that if EPA has sufficient data to indicate that toxic emissions from lime kilns are an ambient air problem, then the regulation should focus on reducing gaseous emissions such as HCl.

**Response**

By limiting emissions of PM, the rule will reduce emissions of non-volatile and semi-volatile metal HAP, which are a subset of PM. As stated in the preamble to the proposed rule, air pollution controls for HAP metals are the same as the PM controls used by the lime manufacturing industry, i.e., FF, ESP, and wet scrubbers. These controls capture non-volatile and semi-volatile metal HAP non-preferentially along with other PM, thus making PM an acceptable indicator of these HAP metals. Quite simply, "PM control technology indiscriminately captures HAP metals along with other particulates....". National Lime Ass'n v. EPA, 233 F. 3d at 639. Consequently, it is an appropriate indicator when the technical basis of the standard is performance of back-end particulate control technology. Id. Another reason for using a surrogate is the lower cost of emissions testing and monitoring for PM as compared to the cost of emissions testing and monitoring for multiple metal HAP that would be required to demonstrate compliance. Because PM control devices control metal HAP to roughly the same efficiency, and because of the associated cost savings associated with emissions testing and monitoring, the Agency has promulgated several other NESHAP where PM is a surrogate for non-volatile and semi-volatile metal HAP.

Regarding the commenter's second point concerning regulating emissions of HCl, the preamble to the proposed rule explained in detail the Agency's decision not to regulate HCl emissions from lime kilns. To summarize that discussion, the EPA determined that, under the authority of section 112(d)(4) of the CAA, no further control was necessary because HCl is a threshold pollutant and HCl levels emitted from lime kilns are below the threshold value with an ample margin of safety, after considering potential threats to both humans and the environment.

### Comment

One commenter (IV-D-12) requests a subcategory for their unique mine chamber exhaust control. Exhaust gas from the kilns is vented to an underground mine chamber which is unlike a baghouse or conventional scrubber, but functions like a scrubber due to moisture in the mine. The typical exhaust temperatures at the exhaust stack range from 107 to 112 degrees F - well below 400 degrees F (a work practice temperature standard that had been considered by EPA for HCl control, but was rejected) . In addition, the condensation moisture assures saturation of the exhaust stream and the contact time exceeds those possible under any conventional pollution control device. The commenter also points out that the mine is not subject to mechanical failures or operator induced malfunctions as are conventional control devices. According to the commenter, stack testing done in 1995 demonstrated removal efficiencies of 98.9 percent for PM, 99.1 percent for SO2, 52.3 percent for NOx, and 71.9 percent for CO.

According to the commenter, the cooling of exhaust gases and subsequent condensation of water and the presence of entrained water droplets makes continuous opacity monitoring infeasible, which is why visible emission readings are currently performed. The visible emission readings taken in the last several years show little variation and no exceedances of the applicable new source performance standards (NSPS) subpart HH kiln opacity standard of 15 percent.

### Response

The commenter is requesting that their use of a mine as a PM control device for their kiln exhausts be placed in a subcategory for wet scrubbers. But, as discussed above in a response to a previous comment, EPA has decided that it will not develop a separate subcategory for wet scrubbers. Subcategorization is normally based on differences in manufacturing process, emission characteristics, or technical feasibility and is not justified solely on the basis of a different type of control device being used. Under this principal, the use of a mine as an emission control device does not warrant a separate subcategory.

## 3.2 <u>PM Emission Limit for Scrubber-Equipped Kilns</u>

### Comment

In response to EPA's request for comments on what the MACT floor limit should be if there was a subcategory for scrubber-equipped kilns, three commenters (IV-D-04, IV-D-06, and IV-D-16) state that the PM emission limit for scrubber-equipped kilns should be 0.6 lb/tsf. This is based on actual operational data and permit limits for the top 12 percent of the existing kilns that use wet scrubbers for PM emissions control. These data were compiled by the National Lime Association (NLA) and provided to EPA.

**Response**

As discussed above, EPA has determined that subcategorizing by existing controls is not appropriate. However, we have also determined that from an overall environmental standpoint, a wet scrubber meeting an emission limit of 0.60 lb/tsf could be considered best control if the environmental disbenefits of switching to a dry control are considered. Therefore, we have set an emission limit of 0.60 lb/tsf for kilns that currently have wet scrubbers for PM control.

### 3.3 PM Emission Limit for New Kilns

**Comment**

One commenter (IV-D-04) states that the PM emission limit for new lime kilns should be 0.12 lb/tsf, the same as the emission limit for existing kilns. The commenter notes that the proposed limit is based on two three-hour test runs at one plant. According to the commenter, EPA recognized in the proposal preamble that 3-hour test results are just a snapshot in time, and should not be used as the basis for establishing an enforceable standard, and that EPA expressly rejected such an approach when establishing the MACT floor for existing kilns.

The commenter believes that data in the docket shows that 0.10 lb/tsf is not continuously achievable by lime kilns, and EPA should not establish a separate PM limit for new lime kilns.

Another commenter (IV-D-16) believes 0.10 lbs PM/tsf for a new kiln is too restrictive, and EPA does not have adequate data to determine that a baghouse or scrubber equipped kiln could achieve this low level of emissions on a sustained basis.

**Response**

The approach to which the commenter refers whereby EPA rejected the use of the "average or mean" in establishing the MACT floor for existing sources, did not refer to the average of individual test runs as implied by the comment. Rather, it refers to EPA's decision to use the median (instead of a simple mean) of the top performing 12 percent to set the MACT floor. Furthermore, as an indication of the achievability of the technology over the long-term, EPA chose to rely on State-imposed permit limits (in conjunction with emissions test data showing that those permit limits are representative of actual performance) in arriving at the MACT floor emission limit.

In test data cited by the commenter, the three-run averages for two sets of emissions tests for the kiln used to set the new source MACT PM limit, are below (0.079 and 0.091 lb/tsf) the proposed PM limit of 0.1 lb/tsf for new lime kilns. The commenter noted that one of the test runs was at the proposed 0.1 lb/tsf PM limit and that the proposed 0.1 lb/tsf limit was, therefore, inappropriate. (It is, of course, reasonable for EPA to establish a standard based on the same methodology that will be used for complying with that standard. Cf. Chemical Waste Management v. EPA, 976 F. 2d 2, 34 (D.C. Cir. 1992) (facially reasonable to require compliance based on methodology used to establish the standard). EPA notes that compliance with emission limits is normally based on a three-run average which can accommodate occasional elevated results as long as the average is at or below the established limit. Furthermore, the emission test results for five of the six top performing kilns were 0.0091, 0.013, 0.026, 0.027, and 0.091 lb/tsf and are below the 0.10 lb/tsf PM emissions limit. These results adequately account for operating variability and indicate that any new kiln using well designed and operated control devices can meet the 0.1 lb/tsf limit. Based on this, we see no basis to conclude that a 0.10 lb/tsf PM emission limit is not achievable or appropriate.

**Comment**

One commenter (IV-D-06) claimed that the proposed NESHAP will require the replacement of their two wet scrubbers with baghouses. They claim there is no space for FF retrofit, and that converting to baghouses will trigger prevention of significant deterioration (PSD) non-attainment review due to increased $SO_2$ emissions.

**Response**

While we recognize that a facility may (or may not) have site-specific space restrictions, we have, on average, adequately accounted for these factors by incorporating cost analysis factors to account for retrofit and equipment demolition. We have also allowed existing facilities 3 years to comply with the final NESHAP. This will provide sufficient time for facilities to replace or upgrade existing equipment during scheduled outages. The averaging provisions in the final NESHAP also provide facilities with additional flexibility concerning replacement or upgrade of existing equipment.

Requiring an existing kiln equipped with a wet scrubber to upgrade their PM controls will not necessarily trigger new source review (NSR). First, we have written the final rule to allow existing kilns equipped with wet scrubbers to meet a 0.60 lb/tsf emission limit, rather then the 0.12 lb/tsf PM emission limit. No commenters have raised any cost or technical issues to indicate that a PM emission limit of 0.60 lb/tsf will force any facilities to choose to convert existing kilns from wet scrubbers to dry controls. Therefore, the facility can choose to replace or upgrade their existing scrubbers, which means there will be no $SO_2$ (or other collateral pollutant) emissions increase to trigger NSR requirements. Second, if they choose to use a baghouse, they may be able to avoid NSR by qualifying for a pollution control project exclusion (67 FR 80186).

## 3.4 PM Emission Limit - General

### Comment

One commenter (IV-D-14) believes the particulate matter emission limits proposed for lime manufacturing kilns and coolers do not represent the maximum achievable control technology and are much less stringent than the limits actually required by the Clean Air Act. The commenter notes that the proposed rule discredits performance test data which demonstrate that particulate emissions of less than half the proposed standard for existing plants are routinely achieved by claiming they may not be consistently achievable, but EPA has provided no statistics. The commenter claims that EPA has chosen instead to base the standards on permit limits, but has selectively eliminated from consideration those permits calling for stringent controls which are currently in place. The commenter gives the examples of Continental Lime which is in compliance with a BACT limit for PM emissions of 0.05 Ib/ton limestone, and Western Lime which is in compliance with a permit limit for PM emissions of 0.06 lb/ton limestone. The commenter states, "Considering just these plants, a recalculation of the existing plant limit leads to a standard of 0.09 to 0.11 lb/ton. The new source MACT floor should be no less stringent than 0.05 lb/ton. However, if EPA chooses to establish a MACT floor on the basis of permit limits, it should consider all of the permit data in its possession (and available to it through delegated State agencies). It is likely that a lower emission limit would represent the MACT floor and that still lower beyond-the floor alternatives would result."

The commenter notes that if performance data do not represent achievable emission limits, EPA should consider design standards based on air-to-cloth ratios. The commenter also believes the proposed particulate emission limits for grinders, conveyors, and bins are also based on data which overstate emissions (in nearly all cases) and do not represent MACT. The commenter believes EPA should examine actual performance test data test or actual permit limitations.

### Response

The kilns to which the commenter refers are Graymont Western Lime (formerly Continental Lime in Broadwater County, Montana and Western Lime in Green Bay, Wisconsin. The permit limits cited by the commenter were apparently reported on EPA Technology Transfer Network (TTN) website. We contacted the Montana Department of Environment and found that the limit for the kiln in question is actually 0.5 lb/tsf and not 0.05 lb/tsf as reported on the TTN website. Also, the complete permit for Western Lime was located on the Wisconsin Department of Natural Resources website, which showed the permit limit for the kiln in question as being 0.12 lb/tsf rather than the 0.058 lb/tsf as reported on the TTN website. Based on the correct PM permit limits for these two lime sources, our conclusions regarding MACT PM limits for existing and new sources are still appropriate. (As the response to a previous comment shows, these permit limits are also representative of actual performance.)

The floor for grinders, conveyors, and bins are based on the existing new source performance standards. We have no data to support a different floor.

## 3.5 Monitoring Requirements for Scrubber-Equipped Kilns

### Comment

Several commenters (IV-D-04, IV-D-06, and IV-D-22) comment that the rule should allow the use of scrubber pump amperage and other indirect measures of liquid flow rate. Commenter IV-D-04 takes issue with EPA's claim that pressure drop and liquid flow rate are most often monitored scrubber parameters. The commenter states that liquid flow rate is not the most common scrubber parameter measured, in part, because the NSPS for lime manufacturing requires the measurement of the liquid supply pressure to the control device. The commenter also states that most permits for lime plants do not require that flow rate be measured directly, and provided permit requirements at existing plants to demonstrate this. They note that of the 8 lime plants that do have flow-related permit limits, 5 of them are provided the option of monitoring scrubber pump amperage instead of flow rate. The commenter also notes that of the four example CAM plans for scrubber-equipped kilns in EPA's CAM guidance, none includes liquid flow rate among the parameters to be monitored. The commenter recommends that the rule allow liquid flow rate to be measured directly (e.g., with a flow meter) or indirectly (e.g., by monitoring scrubber exhaust temperature).

One commenter (IV-D-04) believes the rule should allow the use of parameters other than gas pressure drop if pre-approval from the permitting authority is obtained. The commenter states that monitoring gas stream pressure drop is not appropriate for all kiln types. They use the example of double shaft kilns, for which scrubber pressure drop is measurable only during the fuel firing cycle, returning to zero during the reversing cycle. In addition, the commenter notes that, "like the MACT standard for lime kilns at pulp and paper mills, the lime MACT should be revised to allow the use of parameters other than gas pressure drop if pre-approval from the state permitting agency is obtained."

### Response

The first commenter is correct in stating that the NSPS requires that the liquid supply pressure to the control device be monitored and not liquid flow rate. However, we note that scrubber-equipped lime kilns in other industries have requirements to monitor liquid flow rates to the scrubber. For example, the NESHAP for chemical recovery combustion sources at kraft, soda, sulfite, and stand-alone semi-chemical pulp mills requires that lime kilns (used in reprocessing black liquor at pulp and paper facilities) which are equipped with a wet scrubber must continuously monitor the pressure drop as well as the scrubbing liquid flow rate. (See 66 FR 3196)

The rule as proposed does allow the owner or operator to monitor alternative control device operating parameters subject to approval by the Administrator. Under the proposed rule, if you wish to request the use of an alternative monitoring method, you must submit a request following the procedures in General Provisions section 63.8(f). In order to make this more obvious, we explicitly cross-reference this provision in the monitoring requirements of the rule. However, major modifications to monitoring requirements are not delegated. Therefore, decisions on this issue must be made on a case-by-case basis by the Administrator as set out in 63.8(f).

## 3.6 Monitoring Requirements for Kilns With Dry Air Pollution Control Devices

### Comment

Several commenters (IV-D-04, IV-D-17, and IV-D-16) request that the proposed requirements in § 63.7113(d)(1) and (e)(1) that BLD and particulate monitoring devices (PMD) be certified by the manufacturer to be capable of detecting PM at or below 10 mg/$m^3$ should be deleted because no specifications exist on which to base the certification. Commenter IV-D-04 notes that unlike COMS, there are no technical specifications, regulations, or checks and balances to verify claims made by the BLD or PMD vendor or manufacturer.

### Response

We disagree. The EPA is currently aware of instruments certified to meet levels of 0.2 mg/$m^3$. Specifications on which to base certifications are available in EPA guidance documents.

### Comment

One commenter (IV-D-04) states that the requirements in §63.7113(d)(6) and (e)(6) that BLD and PMD be “installed, operated, adjusted, and maintained so that they follow the manufacturer’s written specifications and recommendations” should be revised to require adherence to the manufacturer’s written specifications and operating procedures (rather than “recommendations”) except where other procedures are determined to be more appropriate and are described and justified in the plant’s operations, maintenance and monitoring (OM&M) plan. The commenter noted that there is no industry-based consensus or EPA specifications, and “there certainly will be applications where the manufacturer’s procedures or recommendations may not be appropriate or where a better approach can be used.”

**Response**

We agree that there may be cases where other procedures are more appropriate then the manufacturers recommendations. For this reason, we allow alternative monitoring under the procedures in 63.8 (f). However, in general , we believe adherence to written specifications and recommendations is more appropriate. Therefore we have retained the requirements in §63.7113(d)(6) and (e)(6) in the final rule.

**Comment**

Several commenters (IV-D-04, IV-D-18, IV-D-17, IV-D-05, IV-D-16, IV-D-13, and IV-D-20) believe COMS should be retained as a monitoring option. Commenters IV-D-04, IV-D-17, and IV-D-16 state that COMS are sensitive enough to detect changes in fabric filter performance at concentrations corresponding to the proposed PM limit and, unlike BLD, are subject to specifications that enable third party evaluation of their performance. Commenter IV-D-04 notes that COMS have been used to detect relative changes in particle mass loading for many years at lime plants. This commenter also states that, "actual COM data acquired at lime kilns with high efficiency filters demonstrate that COM data are appropriate and effective for detecting gradual changes in fabric filter performance over time." According to this commenter, EPA has suggested that BLD are preferable to COMS because they are more sensitive, but that all lime kilns currently equipped with COMS are capable of meeting the sensitivity requirement proposed for BLD.

Commenter IV-D-04 also noted that although the presence of bias makes any determination of absolute opacity below 10 percent inaccurate, "it has no affect on the ability of a COMS to detect changes in opacity at a particular facility -- and hence changes in control equipment performance over time. Detecting relative changes in mass loading is all that BLD are capable of doing (preamble at 78062). COMS are more than adequate to detect changes in the opacity level necessary to detect minor variations in fabric filter or ESP performance well before catastrophic failures occur."

In addition, several commenters (IV-D-04, IV-D-18, IV-D-17, IV-D-05, and IV-D-16) state that requiring only BLD would create unnecessary and duplicative monitoring since other CAA rules and permits require COMS. Since the CAM rule requires that if a COM is required under the CAA or state or local law, it must be used to satisfy the requirements of the CAM rule, requiring BLD or PMD would result in duplicative monitoring.

**Response**

EPA proposed that COMS be allowed as an alternative to BLD, PM detectors, and electrical current and voltage readings for ESP for monitoring continuous compliance with the proposed PM emission limits for lime kilns and coolers. EPA also solicited comments on requiring the use of PM detectors and BLD in lieu of COMS. In response, several commenters stated their support for retaining COMS as a monitoring option. The commenters argued that COMS have a long history of use by the lime manufacturing industry and that they are effective for detecting changes in control device performance over time. As a result, EPA sees no reason to not allow the use of COMS.

The commenters also claimed that requiring BLD or PM CEM would be redundant because the CAM rule requires COMS. The CAM rule only applies where a control device is used to comply with an emission limit proposed prior to November 15, 1990. Therefore, the CAM rule will not apply to monitoring requirements related to compliance with the Lime Manufacturing NESHAP.

**Comment**

One commenter (IV-D-04) commented that EPA should clarify that only COMS installed, relocated, or substantially refurbished after February 6, 2001 must comply with the version of PS-1 revised on August 10, 2000. Because many COMS at lime plants were certified to meet the PS-1 requirements in effect at the time of installation, the commenter states that it is "impractical and cost prohibitive to remove these units from service for several months and return them for testing to the COM manufacturer. The cost to re-certify a single monitor would exceed the cost of a new monitor due to the test regime specified in the ASTM standard."

**Response**

The proposed rule states that you must install, operate, and maintain COMS as required by 40 CFR part 63, subpart A, General Provisions and according to PS-1 of Appendix B to part 60. The current version of PS-1 itself specifies that it only applies to COMS installed, relocated, or substantially refurbished after February 6, 2001. However, this could result in the rule being unclear on the requirements for COMS installed on or before February 6, 2001. Therefore, we have clarified the rule to state that COMS installed, relocated, or substantially refurbished after February 6, 2001, must meet the requirements of PS-1 as revised on August 10, 2000. Any COMS installed on or before February 6, 2001, should continue to meet the requirements in effect at the time of installation unless the local regulatory agency specifically required recertification of the COMS in question.

**Comment**

One commenter (IV-D-19) states that opacity does not correlate to PM mass emissions. The commenter notes the EPA has stated on several occasions that STET systems (COMS) can determine opacity, but COMS cannot determine PM emissions. And if particle density changes but the particle size remains the same, opacity will not change while the mass emission rate will change in proportion to the density change. The commenter agrees that PM is a technically sound surrogate for HAP metals, but disagrees that opacity serves as a surrogate for HAP metals as stated in the proposal preamble.

The commenter does not believe that a COMS can be used to evaluate the continuous compliance status of kilns, coolers, or materials processing operations (MPO) that have a mass emission limit. The commenter is not aware of any data that shows a definitive link between opacity and mass emissions except in very limited and controlled situations. In addition, the commenter does not understand how a 15 percent 6-minute average opacity limit can be correlated to a 3-hour rolling average PM emission limit of lb/ton of stone feed.

The commenter states, “the error in using a COMS to determine compliance with the PM mass emission limit can be demonstrated from the data presented to you by the National Lime Association. If one of the top performing lime kilns has a measured emission rate well below the 0.12 lb/ton of feed emission limit, but has a reportable opacity between 10 and 15 percent, there can be no correlation.”

The commenter believed a better alternative is to use a monitor that measures PM mass emissions in units that are directly related to the mass emission limit. The EPA should consider using a PM continuous emissions monitor (CEM) for continuous compliance determination of kiln, cooler, and MPO emissions with or without a PM CEM performance specification. The commenter notes that EPA’s stated reluctance to use a PM CEM in the absence of performance specifications is inconsistent with the remainder of the standard, since the use of bag leak detector systems (BLDS) and a PM detector are proposed without performance specifications. The commenter also notes that an extractive type PM CEM designed to operate in wet exhaust streams would provide a direct indication of compliance for wet scrubbers.

**Response**

We agree that a COMS cannot directly measure PM emissions. However, we believe that a properly calibrated and maintained COMS is sufficient to demonstrate long term PM control device performance. The purpose of the monitor is to demonstrate, with reasonable certainty, that the PM control device is operating as well as it did during the PM emission test used to demonstrate compliance. Though we agree that a continuous monitor that directly measures PM emissions would provide direct evidence if the PM emission limit is exceeded, we have no data to demonstrate that this would result in additional PM emissions reductions compared to monitoring the control device with a COMS. Therefore, requiring facilities to remove their currently installed COMS and replace them with a PM CEM only adds additional costs with no quantitative environmental benefit. We also note that we know of no lime kiln that currently has an operating PM CEM.

**Comment**

One commenter (IV-D-19) provided comments on the cost of PM CEM. The commenter provides cost data for several monitor technologies, and notes that the list price is only part of the cost of installing and using a PM CEM.

**Response**

We thank the commenter for this additional data. However, because we are not requiring PM CEM as a monitoring option, we are assuming that facilities will opt to use a COMS due to the lower costs. Because most existing facilities already have a COMS installed, we have not revised our rule costs to incorporate this data.

**Comment**

On commenter (IV-D-19) provided comments on the relation of a PM CEM requirement to the proposed PM emission limits. The commenter sees no reason to change the proposed level or averaging time of the PM emission limit if a CEM is used. The commenter suggests having a lime manufacturing plant purchase, install, and operate a PM CEM to monitor emissions over a period of time (e.g., 6 months) to confirm the proposed limit and averaging interval.

**Response**

Since we believe that the monitoring options of the proposed rule are adequate to show good operation of emissions control devices, it is not necessary to perform testing using a PM CEM.

**Comment**

One commenter (IV-D-04) states that PM CEM should not be required in the lime MACT because EPA has no data on which to establish an achievable CEM-based PM limit.

**Response**

We disagree. Because PM CEM directly measure the PM emission rate, the appropriate limit would be 0.12 lb/tsf (existing sources) or 0.10 lb/tsf (new sources). However, we are not requiring PM CEM, they are an option.

**Comment**

Commenter IV-D-19 believes that EPA needs to include beta gauge and optical scintillation along with light scattering technology for the PM detector.

**Response**

The final rule allows use of PM CEM as an option. Should PM CEM be used, they must meet appropriate performance specifications. Any type of PM CEM, including those that rely on beta gauges or optical scintillation, that meets the performance specifications may be used.

**Comment**

Several commenters (IV-D-04, IV-D-18, IV-D-06, IV-D-11, and IV-D-09) believe EPA Method 9 should be allowed for positive pressure baghouses. According to commenter IV-D-04, the BLD Guidance Document recognizes that requiring BLD would be very costly, and states that the document does not apply to this type of baghouse (BLD Guidance Document, pg 2). This commenter gives the example of a small business (Austin White Lime) that would be required to have a BLD for each of the 8 compartments in its baghouse under the proposed rule, and whose Title V permit allows Method 9 monitoring for the baghouse. According to commenter IV-D-09, the associated costs of installing a separate BLD or PM CEM sensor on each discharge or new common stack could easily exceed $1,000,000. The commenter notes that, "baghouse pressure differential readings, together with fan amperage and daily visible emission notations (Method 22) will provide the necessary performance assurance with ample and timely indication of baghouse failures or malfunctions."

**Response**

We acknowledge that there are precedents for the use of alternatives to COMS, BLD, and PM CEM on positive pressure baghouses that have multiple stacks. The NESHAP for portland cement, an industry that has similarities to the lime manufacturing industry, allows the use of method 9 opacity monitoring for kilns having control devices with multiple stacks. For existing lime kilns controlled by positive pressure control devices having multiple stacks, the final rule provides the option of using method 9 for daily opacity monitoring. We are also revising the rule to allow Method 9 monitoring if the control device vents through a monovent, or if installation of a COM in accordance with PS-1 is infeasible.

**Comment**

One commenter (IV-D-04) believes that COMS should be used as the monitoring option for ESP. The commenter claims that using PM detectors on ESP is problematic, as is parametric monitoring if the ESP is over-designed such that operating at or above the voltage levels measured during the performance test is not needed to maintain compliance with the PM limit.

One commenter (IV-D-19) comments that there are no data to support the use of ESP operating parameters to determining compliance. The commenter notes that until the lime industry collects this data in three-hour rolling averages for extended periods of time in a reportable format that can be analyzed by others, no conclusions can be made regarding the usefulness of ESP operating parameters in determining compliance or mass emissions.

**Response**

We agree with the commenters that COMS and PM CEM should be sued to monitor the performance of an ESP. Therefore we have modified the final rule ro require a COMS or PM CEM to be used to demonstrate continuous compliance. Because we are now requiring COMS or PM CEM, monitoring ESP voltage and current is not be required.

**Comment**

One commenter (IV-D-09) believes that stack testing on positive pressure baghouses should not be required. The commenter notes that the eight stacks at each of its positive pressure baghouses are nearly inaccessible and too short to be properly tested, and "attempting a performance test ...would be dangerous without significant additional improvements...," and, "the cost of all of these improvements could exceed $1,000,000." The commenter believes positive pressure baghouses with multiple inaccessible stacks should be given the option to perform a 3-hour Method 9 performance test when operated in conjunction with performance monitoring.

**Response**

EPA regulations generally require, at a minimum, initial performance testing to demonstrate compliance with emission limits for affected sources. Further, the General Provisions section 63.7(d) require sources to provide adequate testing. Positive pressure baghouses are used in many of the industries that are subject to EPA regulations and are required to conduct performance testing in order to demonstrate compliance. EPA has developed procedures for testing PM emissions from various configurations of positive pressure baghouses, which are contained in Method 5D of 40 CFR part 60, appendix A. Therefore, we have decided not to alter the compliance requirements for sources using positive pressure baghouses.

**Comment**

One commenter (IV-D-19) does not understand how an alarm level will be set for a PM detector or a BLD system that will have any correlation to a PM emission limit in units of lb/ton of stone feed. The commenter states that an extensive amount of testing over varying conditions at or near the limit would be needed to establish the response of BLD or PM detectors as a function of actual PM emissions. The commenter also notes that EPA's bag leak detector guidance does not provide such procedures.

**Response**

We have not stated that BLD limits and PM limits correlate. BLD are calibrated at the time the PM emission test is run. The BLD then detects changes in performance verses performance during the PM emission test.

## 3.7 Operating Parameters

**Comment**

One commenter (IV-D-04) states that a single excursion from operating parameters recorded during a 3-hour compliance test should not constitute a violation. The commenter believes that, "the NSPS kilns are the lime industry's top performers, and their monitoring regime should be the benchmark against which monitoring under the MACT rule is prescribed." Since a violation under the NSPS does not occur unless the parameter is greater than 30 percent below the rates established during the performance test, the commenter recommends a 30 percent "buffer" between the permit limit and the 3-hour average recorded during the compliance test. Or, "alternatively, like the Pulp and Paper MACT, the rule should specify that a violation of the standard does not occur unless 6 or more 3-hour average parameter values are recorded outside the established range within the 6 month reporting period."

The commenter notes that EPA's CAM guidance document states, "Use of only 3 hours of parameter data may not be sufficient to fully characterize parameter values during normal operation." The commenter also noted that language in the proposal preamble cautions against developing enforceable emission standards based on 3-hour compliance tests. The commenter also notes that none of the CAM plans for scrubbers base a permit limit on the 3-hour average reading that occurred during a compliance test, and two of the plans allow a 15 percent buffer to account for variability.

The commenter provided gas pressure drop readings and concurrent PM test data for three kilns, and noted that for each of them, gas pressure drop during one or more 1-hour runs was below the proposed 3-hour average. The commenter stated that under the proposed rules, these readings below the 3-hour average would constitute a violation.

The commenter also believes the rule should provide an exemption from the PM emission limit during performance testing. The commenter stated, "plant operators may need to conduct a series of performance tests to determine the minimum pressure drop and liquid flow rate levels that will assure compliance for each set of operating conditions used for a particular kiln. Results for these tests are not available until post-test laboratory analyses are completed."

**Response**

Each owner/operator is required to define the compliance parameters to be monitored in their OM&M plan. Then, during the initial performance tests they are required to monitor and establish the value or range of the parameters. EPA believes that the initial performance tests will be designed to give the owner or operator flexibility in adhering to the established range for monitored parameters. These values must be reported in the results of the test and in the notification of compliance status to the permitting authority and must be approved by the permitting authority. During subsequent operations, if the monitored parameters exceed the values or fall outside the range determined during the initial performance test, it is a violation of the operating requirements of the standard (unless it is the result of a malfunction to which the facility responds to in accordance with the startup, shut down, and malfunction [SSM] plan). We have has no basis for allowing deviations before considering the facility to be in violation. The owner/operator has ample opportunity to establish a range for the operating parameters and must thereafter operate within that range.

Most operating parameters are calculated as 3-hour averages. This is generally consistent with performance test times. Thus, a one-hour period of insufficient gas pressure drop would not, by itself, be considered a deviation.

**Comment**

One commenter (IV-D-04) stated that the accuracy criteria in Table 4 (items 8, 9, 13, and 14) for devices used to measure operating parameters should be deleted. The commenter notes that the lime MACT is unique because it includes both accuracy and minimum tolerance criteria for measurement devices; other recent MACT rules contain only tolerance criteria. In addition, the commenter states that EPA has offered no explanation for the proposed accuracy criteria in Table 4. The commenter believes it is the precision of a device (i.e., the value of a parameter relative to what was recorded during the performance test) that is important in the context of the lime MACT, not its accuracy.

**Response**

We disagree. We commonly include accuracy criteria in MACT standards for devices used to measure operating parameters. We continue to believe that monitoring devices of known accuracies should be used.

### 3.8 <u>Opacity Limit</u>

**Comment**

In response to EPA's request for comments on the appropriate opacity limit (EPA is considering an opacity of 10 to 15 percent), several commenters (IV-D-04, IV-D-18, IV-D-17, and IV-D-16) agree that the opacity standard for lime kilns should be 15 percent as proposed. One commenter (IV-D-04) provided additional data in the form of opacity data from four kilns. According to this commenter, the opacity data for selected kilns (Docket Item No. I-B-125) are not reliable for establishing an opacity standard because they are from visible emission data collected for brief periods of time under poor viewing conditions.

**Response**

Based on information considered prior to proposal as well as additional information supplied by commenters, EPA is retaining the 15 percent opacity limit for sources controlled using FF and ESP. Information considered by EPA in proposing the opacity limit suggested that the average opacity permit limit of the top performing lime kilns was 15 percent. Information provided by the commenters supporting the proposed opacity limit indicated that opacity levels may vary between 10 and 15 percent even for well operated and maintained control devices. No information supporting a more stringent opacity limit than the one proposed was submitted by any commenter. Therefore, EPA finds no justification for a limit more stringent than the proposed 15 percent.

**Comment**

Several commenters (IV-D-04, IV-D-18, IV-D-17, IV-D-07, IV-D-05, and IV-D-13) state that the rule should specify a time period during which opacity readings greater than 15 percent are not considered a violation. One commenter (IV-D-04) requests at a minimum that the rule state that opacity readings greater than 15 percent for less than 1 percent of the reporting period are not considered to be a violation.

One commenter (IV-D-07) noted that it operates two of the top six performers in the industry, and it is impossible not to have occasional readings that would be violations if there were no allowances for them. The commenter's State permits allow 1 percent of operating time per quarter to exceed the opacity limit.

Commenter IV-D-05 requests that the final rule state that a particulate matter violation has occurred if: (1) opacity readings exceed the15 percent opacity limit for 6 percent or more of the operating time in a quarter or, (2) opacity readings exceed the 15 percent opacity limit for 20 total hours in a quarter, whichever time frame is longer.

Commenters IV-D-04 and IV-D-05 refer to the Pulp and Paper MACT as an example of an existing rule with such an exemption.

**Response**

We find no justification to support allowing excursions above the 15 percent opacity limit. We believe that well operated and maintained control devices will typically operate at opacity levels much lower than 15 percent. Other NESHAP, including the portland cement NESHAP, contain opacity limits from which no exceedances are allowed.

In response to the commenters' concerns about occasional excursions above the opacity limit, there are times when opacity levels above 15 percent are not considered to be a violation of the rule. These include periods when a control device malfunctions, or is in a period of startup or shutdown. If opacity levels exceed 15 percent as a result of a control device startup, shutdown, or malfunction, it would not be considered a violation of the opacity limit. The same is true during periods when a monitoring system malfunctions or is being calibrated; provided the startup, shutdown, and malfunction (SSM) plan is followed. Information supplied by one commenter showed opacity readings for several kilns over several days. Nearly all of the readings were well below the 15 percent limit with just a few exceptions for each kiln. The commenter that supplied the opacity readings was asked to supply additional information regarding the opacity excursions above 15 percent. In each instance, the high opacity reading was explained by a startup, shutdown, or malfunction of the control device or by a malfunctioning monitor or a monitoring system that was undergoing calibration, none of which would be considered a violation of the opacity limit. As a result, we believe that well operated and maintained control devices can meet the opacity limit, and that occasional excursions above the limit due to control device or monitoring system malfunction will not be a violation of the rule provided the SSM is followed.

## 3.9 Stone Handling Operations

**Comment**

Several commenters (IV-D-04, IV-D-17, and IV-D-11) request that the terms "raw material processing" or "material processing operation (MPO)" be replaced with the term "processed stone handling" since the only ingredient used to make lime is processed limestone. Commenter IV-D-11 noted that the use of "raw material" could be construed to include unprocessed stone and thus potentially include stone handling operations in the quarry.

Commenter IV-D-09 notes "the exclusion of storage piles from this proposed NESHAP is consistent with other standards such as the Portland Cement Manufacturing MACT, Integrated Iron and Steel Manufacturing MACT and the Non-metallic Minerals Processing Plants (Subpart

000) NSPS." The commenter believes that storage piles prior to any processing operation are a continuation of raw material handling and should be exempt from the MACT.

Commenter IV-D-11 also requests that the rule clarify that material stockpiles are not regulated. The commenter notes that this exclusion has been granted in other MACT's such as the Cement MACT, and the nonmetallic mineral processing NSPS.

**Response**

The rule has been revised to clarify that the first emission unit subject to the rule is "processed limestone storage" immediately before the kiln, and we have changed the term "materials processing operation" to "processed stone handling" in the final rule.

**Comment**

Several commenters (IV-D-04, IV-D-17, IV-D-16, and IV-D-11) commented that the definition of "storage bin" in § 63.7143 should be revised to clarify that bins are manmade enclosures used to store processed stone feed for the kiln. Commenter IV-D-04 noted that this is consistent with the definition in the cement MACT, and that it clarifies that storage piles are not subject to the rule. Commenters IV-D-04 and IV-D-16 recommend the following amended definition: "A manmade enclosure for storage of processed limestone prior to its use as lime kiln feed."

**Response**

The rule has been revised to clarify that storage bins refer to manmade bins for storage of processed limestone.

**Comment**

One commenter (IV-D-04) believes the rule should not require the use of proposed Methods 203A, 203B, and/or 203C to measure opacity from fugitive sources. The commenter notes that the preamble does not state why Method 9 is unsuitable, "nor does it specify how Methods 203A,B, or C would be used and what the corresponding opacity limit would be.

**Response**

We requested comment in the proposed rule on the use of proposed Methods 203A, 203B, and/or 203C to measure opacity from fugitive sources. We never stated that Method 9 was unsuitable. We were concerned that because Method 9 was developed to measure emissions from stacks, and an alternative method might be more suitable.

We have decided not to allow the use of proposed Methods 203A, 203B, and/or 203C in the final rule. However, we have added additional language to the final rule to explain how to use Method 9 to determine opacity from fugitive sources. This language was taken directly from 40 CFR 60, subpart OOO, Standards of Performance for Nonmetallic Mineral Processing Plants.

**Comment**

Two commenters (IV-D-04 and IV-D-17) request section 63.7120(b) be revised to clarify that periodic (not continuous) monitoring is required for stone handling units.

**Response**

EPA has revised the rule to clarify that stone handling operations are generally subject to monthly visible emissions testing and not continuous monitoring.

## 3.10 Test Methods

**Comment**

Several commenters (IV-D-04, IV-D-05, and IV-D-08) asked that EPA delete the bias and precision criteria for HCl test results using ASTM Method. Commenter IV-D-04 states, "the commercial lime industry has invested substantial resources to develop a method to address EPA's concern that Method 26 understates HCl emissions. An ASTM committee has concluded that Method D 6735-01 generates data that has no statistically significant bias. It is arbitrary and unreasonable for the Agency to burden the commercial lime industry – half of which is comprised of small businesses – with a requirement to conduct analyte spiking to prove that HCl test results are unbiased. Likewise, requiring paired runs to comply with a precision criteria is not warranted because (1) EPA has never raised any concerns about the precision of impinger generated HCl data, and (2) ASTM Committee D22 on Sampling and Testing of Atmospheres approved the impinger-based method after evaluating the precision of the data generated with the method. Accordingly, the bias and precision criteria for HCl test results obtained using ASTM Method D6735-01 should be deleted from the rule." Commenter IV-D-05 notes that these criteria are not found in the ASTM method.

**Response**

The ASTM validation proved that, when ASTM Method D6735-01 is conducted properly, it is possible that data are not biased. However, because the ASTM method lacks precision, the power of this conclusion is not very strong. The validation does not assure that future applications of the method run by another group will also be unbiased. Sampling for HCl in a lime plant environment is difficult. The purpose of analyte spiking is to assure that a representative sample is transported from the stack through the probe and filter to the impingers regardless of who is performing the test. Analyte spiking is an option in the ASTM procedure; because of the importance of the decision made as result of this data, we chose to exercise that quality assurance option. We agree with the commenters that analyte spiking is a complex procedure. However, it is a requirement of the Method 320 instrumental FTIR method which we believe is superior. There is no reason to allow less quality assurance for the inferior method. However, we agree with the commenter that for the purpose of determining major/area status, it is not necessary to reject a set of data if the apparent bias does not change the major/area source determination.

With respect to the commenters' suggestion that the precision criterion be deleted, EPA disagrees. It is an option in the ASTM procedure which EPA chose to require. Reasonable agreement between paired samples is considered a strong indication that the method is being consistently operated, recovered and analyzed.

One commenter (IV-D-04) cited section 6.3.1.2 (of EPA Method 301) as the EPA precision criteria for an acceptable alternative method. They mistakenly thought the proposed rule would impose a much more stringent precision criteria (i.e. 50 percent RSD). In fact, when an acceptable method already exists (as in this case), Section 6.2 of EPA Method 301 applies, which requires a candidate alternative method to be at least as precise as the method for which it is intended to be substituted. However, because the industry is reluctant to embrace the use of the acceptable method (EPA Method 320 or 321), we waived the requirement that the alternative method to be at least as precise (as allowed by section 1.1.1 of EPA Method 301). Therefore, in order to allow the use of the less precise ASTM method, we instead chose to have the testers demonstrate their ability to get reasonable agreement at the actual facility. Note 3 in section 4.1.4 of the ASTM method reinforces this approach in that it states "The particulate matter of mineral calcining facilities adsorbed HCl and HF to varying degrees. The amount of adsorption depends on process parameters and the physical/chemical properties of the dust."

**Comment**

Commenters IV-D-05 and IV-D-08 note that ASTM Method D6735-01 includes optional paired train and spiking procedures. The commenter is unclear what basis EPA has used to make these optional procedures mandatory.

**Response**

We disagree. Exactly because it is an option to use paired trains and analyte spiking procedures in the ASTM method, EPA clarified that for this application those options were exercised. Section 5.4 of the ASTM method states "the test specific precision may be determined by conducting paired runs." Paired runs aid in identifying possible suspect data and provide backup in the event one train is invalidated. Performing paired runs depends on the test specific data quality objectives. Section 5.3 has a similar statement regarding analyte spiking. In the bigger picture, if the only options available to us were to accept or reject an ASTM method with no alterations, we would have to reject many more ASTM methods for relatively easily corrected reasons. This would severely limit our good-faith implementation of the National Technology Transfer and Advancement Act.

**Comment**

Commenter IV-D-08 notes that there is no discussion in the proposal preamble explaining where the 20 percent limit for absolute relative standard deviation (RSD) came from. The commenter requests that the requirement be deleted, since the ASTM method does not mention criteria for accepting or rejecting a test, and since the ASTM results are completely consistent with EPA's own RSD criteria of 50 percent. If EPA insists on including the paired train requirement and an associated RSD criterion, the commenter believes a ppm difference should be considered, particularly for low concentration sources. The commenter suggests that if the RSD exceeds 50 percent, the results continue to be valid provided the absolute difference between the two train values is 3 ppm or less.

Commenter IV-D-05 requests that the ASTM method be incorporated by reference as it is written.

**Response**

We agree with the commentator that it may not be necessary to reject data with poor precision if it doesn't affect the major/area source decision. However, we disagree that the way to attain this goal is to provide an absolute value that is acceptable regardless of how close to the action level the data are.

**Comment**

Commenter IV-D-08 stated that the regulation would require four valid runs, which are too many, noting that nearly all methods require three runs and not four. The commenters states that the ASTM method defines the test to be three or more runs and that EPA should have the same wording. Commenter IV-D-05 asked that if a spiking procedure and spike recovery criterion are included in the final rule, that we confirm that the three test-run requirement of the ASTM method is met with two non-spiked runs and a third, spiked run.

**Response**

As discussed above, EPA disagrees that we are confined to exactly what the ASTM method states. In this case the ASTM method merely sets a minimum of three. However, in this case EPA, agrees that three or more runs may constitute a test.

Our intent is that two of the three runs be made with paired trains, and one run be made with paired trains where one train is spiked.

**Comment**

One commenter (IV-D-10) believes ASTM D6735-01 to be a “primitive” or inferior measurement technique, and EPA Method 320 (FTIR) to be a clearly superior method for HCl measurements. The commenter notes that EPA Method 320 directly measures HCl, while D6735-01 measures total chloride. There is no need to conduct indirect measurements, since there is a reliable test method that directly measures HCl.

The commenter states that EPA Method 320 has a typical RSD of approximately 1 to 2 percent compared to 30 to 50 percent RSD for D6735-01. The commenter provides cost data for EPA Method 320, and notes that the methods (EPA Method 320 and ASTM D6735-01) have virtually identical costs. The commenter urges EPA to require the use of EPA Method 320 for lime HCl measurements.

**Response**

We agree that FTIR is the best choice of test method to measure emissions of HCl, and note that the cost estimate provided by the commenter is close to the EPA estimate of cost to perform the ASTM method. However, we feel that the EPA can use data from a properly conducted ASTM D6735-01 test to determine if the source qualifies as an area source. We agree that there is a potential to incorrectly conclude that the source is major, when in fact, it is not.

## 3.11 Economic Impact Analysis

**Comment**

One commenter (IV-D-06) claimed that the econimic impacts analysis (EIA) neglected to include some significant costs of implementing the proposed rule, including the cost of dismantling existing equipment, lost sales during downtime, and the cost of re-hiring personnel after plant modifications if scrubbers must be replaced. The commenter also noted that maintenance and supervisory personnel currently do not work evening and weekend shifts, but would likely be required in the event of failure of the recommended monitoring equipment.

Another commenter (IV-D-02) believes EPA's estimated $1.17 per ton of lime cost estimate is low, and the cost to a typical lime producer will be significantly higher. In particular, the commenter noted that the additional power required for high pressure drop scrubbers alone would be approximately $1.30 per ton of produced lime. In addition, EPA's estimated equipment costs appear to be low.

### Response

The commenters believe either that implementation costs (IV-D-06) or power costs (IV-D-02) are not properly represented. As discussed in the response to comments regarding a separate subcategory for scrubbers, estimated implementation costs used for the EPA model plants include costs for demolition of existing equipment and credits for salvage value. Because plants have a three-year period in which to comply with the proposed rule, it is expected that scheduled downtime will be used for disconnecting an existing scrubber and connecting a new scrubber. As a general practice, building a new scrubber while the existing scrubber remains in operation is preferable to taking the associated kiln out of service for an extended period of time and losing production from the kiln. The plant is expected to use its labor force in the manner normally found for planned downtime. Such labor costs (or savings) would not be attributable to compliance with the proposed rule.

Power costs for new scrubbers are costed incrementally, i.e., costs are estimated for the difference between 35 in. w.g. (new scrubbers) and 14 in. w.g. (existing scrubbers) as used in Docket Item No. II-B-122. For individual model kilns, summing the power costs and dividing by the model's production rate gives estimated incremental power costs ranging from $0.82 to $1.47/ton of lime. On a nationwide basis, aggregating the model kiln costs apportioned among the affected kiln population provides average costs as estimated by EPA.

### Comment

Commenter IV-D-04 stated that the EIA is seriously flawed because it assumes lime producers can pass control costs through to consumers. The commenter maintains that lime producers cannot raise prices. The reasons include a highly competitive market due to overcapacity, competition from unregulated sources, competitive substitutes exist for most key markets, and significant market resistance. The commenter also claimed that recent history proves that prices cannot be increased. Finally the commenter stated that because the price increase assumed by EPA is erroneous, EPA's prediction that only two lime plants will close seriously understates the impact. One other commenter (IV-D-12), also stated that they could not increase prices.

**Response**

The fact that many lime plants are currently operating at less than full capacity implies that their supply curves should be relatively elastic (flat) at current production levels because lime producers can fairly easily change output without running into capacity constraints. Based on standard economic theory, under perfect competition the supply curve for each firm is equal to their marginal cost curve and each producer chooses to produce the quantity where their marginal costs are equal to the market price in order to maximize their profits. The market supply curve is the sum of the supply curves of the individual firms and will reflect the responsiveness of the individual firms to changes in price. Assuming that the lime industry is very competitive (as argued by IV-D-04) and has substantial overcapacity implies that the industry marginal cost curve (and the market supply curve) should be relatively flat at current production levels. To the extent that the costs of the lime manufacturing MACT standard increase the marginal costs of lime production[3], having a very elastic (flat) supply curve is a textbook case where the majority of the costs are passed on to consumers. A highly competitive market implies, by definition, that individual producers cannot unilaterally increase their prices without losing most, if not all, of their customers. It does not imply that the market price will not increase in response to a general increase in the cost of lime production due to environmental regulations.

It is certainly true that foreign lime suppliers (including suppliers located in Mexico) gain because this regulation applies only to domestic lime producers. The EIA assumed that import supply was quite elastic (elasticity of 7.0) and foreign suppliers are shown to increase their output and their profits in the EIA. However, imports of lime account for an extremely tiny share of the lime market prior to the regulation (about 1 percent nationally) and even a fairly large percentage increase in imports shows up as a very small change in absolute terms. The fact that imports account for such a small share of the U.S. lime market implies that transportation costs are too high for imported lime to be competitive in the majority of the U.S. The barrier to imports caused by these high transportation costs is expected to prevent significant replacement of domestic lime with imported lime.

Commenter IV-D-04 states that commercial lime producers would be unable to raise prices for lime they sell to paper plants during times when the paper plants' captive lime facilities are off-line because the paper plants would simply manufacture and store more lime at their own facilities at much lower cost. It is possible that this would happen to some extent, although paper plants already have the option to produce more lime captively. The fact that they purchase commercial lime currently suggests that they value the option of buying on the spot market and may not substantially change their inventory practices unless there is a sufficient increase in price. In addition, it is true that captive lime kilns that are exempt from this MACT standard (e.g., kilns that are covered by other regulations, such as those in the beet sugar

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[3] A substantial portion of the cost associated with this rule is for kiln retrofits with capital equipment such that compliance capital expenditures may not vary greatly with output. However, maintenance costs and compliance capital depreciation are expected to vary directly with output such that the marginal costs of production are increased.

industry) could possibly begin to operate during their current down times and sell lime into the commercial market. However, the fact that they do not currently find it worthwhile to do so again implies that the price increase would have to be large enough for them to significantly change their current operating procedures.

To examine the historical supply responsiveness in the lime market, we estimated the supply elasticity for lime using data from 1983-2001. These estimates capture the overall change in the quantity of lime supplied in response to a change in the real (inflation-adjusted) price of lime, including any entry or exit of captive suppliers from the market. Based on estimates obtained from the econometric model, the domestic lime supply elasticity was 1.24 at the average price and quantity for the period and 0.98 using the lime price and quantity for 1997, the baseline year for the EIA. The value for the baseline year implies that a 1 percent increase in price would lead lime producers to increase their lime production by 0.98 percent, other things being equal.

For the lime price to remain constant due to entry into the commercial market by captive suppliers, that entry would need to be sufficient that it led to the market supply curve being perfectly elastic. There is no evidence for a perfectly elastic market supply curve due to large-scale entry based on historical estimates of the responsiveness of lime supply to changes in real price.

There are substitutes for lime in many of the markets in which it competes, such as crushed limestone, caustic soda, soda ash, and other products. However, unless the alternatives are perfect substitutes, this does not imply that the price of lime will not increase in response to an increase in production costs. The products have different attributes and different prices and are clearly not perfect substitutes. In addition to estimating the overall responsiveness of supply, we also estimated the responsiveness of the quantity of lime demanded using an econometric model and data from 1983-2001. In that model, an inflation-adjusted price for alkalies and chlorine was used to represent the effect of the price of lime substitutes on the quantity of lime demanded.[4] The results show that the cross-price elasticity of lime with respect to the alkalies and chlorine price is 0.30 for the baseline year. This suggests that a 1 percent increase in the alkalies and chlorine price would result in a 0.30 percent increase in the quantity of lime demanded, implying that these products are substitutes. However, they are not perfect substitutes. While it is expected that there would be some substitution of alternative products for lime in response to a higher lime price, it is highly unlikely that other products would be treated as perfect substitutes for lime such that the market lime price literally could not increase without all buyers substituting other products.

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[4] Many alternative substitutes were used in alternative model specifications, but the model with the alkalies and chlorine price was the preferred model based on model fit and consistency with economic theory.

> Assuming that lime is a highly competitive market, economic theory tells us that individual lime producers should not be able to unilaterally increase the price of their output without losing most, if not all, their customers. If a firm raises their selling price above the market price, their customers are expected to shift all of their business to firms selling at the market price. However, this does not imply that the market price for lime cannot increase in response to changes in production costs that shift the market supply curve.

To test the responsiveness of lime demand to price, we estimated the demand elasticity for lime using an econometric model of the industry and data from 1983-2001. The results of the model suggest that the demand for lime is elastic, with an elasticity of -1.43 at the average price and quantity over the 1983-2001 period. Based on the price and quantity in the baseline year, 1997, the elasticity for that year is calculated to be -1.14. The value for the baseline year means that the quantity of lime demanded would fall by 1.14 percent in response to a 1 percent increase in price based on historical data. A claim that the lime price literally cannot increase due to high demand responsiveness implies that the market demand curve is perfectly flat[5] (elasticity is equal to negative infinity), which is clearly not supported by empirical evidence. The fact that some firms are tied into long term contracts at a fixed price may delay increases in price in some markets until the contracts expire, but prices are still expected to increase following expiration of existing contracts.

The fact that lime prices have not increased in recent years despite plant closures and increases in real prices in no way implies that those events do not exert upward pressure on prices. The relevant comparison is the price with and without those events, not before and after they occur. It is expected that prices would have been even lower if there had not been closures and increases in input prices.

As outlined in the responses to these comments, there is no evidence to support the claim that the assumption that lime price will increase is erroneous, and that the estimated economic impact of the rule is understated.

### Comment

Two commenters (IV-D-04, and IV-D-20) claimed that the EPA's sensitivity analysis does not adequately respond to the small business advocacy review (SBAR) Panel's recommendations.

### Response

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[5] Unlike the market demand curve, the demand curve facing an individual firm in a perfectly competitive market is expected to be perfectly flat (demand elasticity of negative infinity).

In response to industry comments and to verify the reasonableness of the EIA results, market supply and demand elasticities were estimated for lime. The values from the preferred model for 1997 are very close to the primary elasticities used in the main text of the EIA and are well within the range of elasticities used in the sensitivity analysis in Appendix B. In addition to the preferred model, numerous alternative models were estimated. As with any modeling exercise, there were some differences in results across different model specifications. However, the results were generally similar across specifications and there were no cases in which the estimated supply or demand elasticity fell outside the ranges currently used in the Appendix B sensitivity analysis included in the EIA. Thus, the current analysis adequately responds to SBAR panel recommendations that a reasonable sensitivity analysis be employed and the empirical evidence is supportive of the current scenario presented in the Section 4 of the EIA.

**Comment**

One commenter (IV-D-04) stated that the EPA economic model for the lime market assumes a nationally perfectly competitive market, but lime prices are primarily dictated by large producers who sell capacity regardless of price.

**Response**

This comment suggests that large lime producers have market power and therefore face a downward sloping demand curve and have some ability to set prices. If large lime producers do possess market power, then profit-maximizing behavior would imply that they would restrict output below the levels expected under perfect competition in order to increase market price to the point that their marginal revenue is equal to their marginal cost. The large producers may have lower marginal costs such that the resulting price makes it difficult for the small producers that take the market price as given to remain in business. However, the presence of market power in the lime industry would tend to increase prices relative to the perfectly competitive case, not decrease them.

**Comment**

One commenter ( IV-D-06) stated they sell 40 to 50 percent of their lime to the soil stabilization market, an area that has encountered competition from liquid petroleum byproducts. These low-cost, marginally effective products have made substantial progress entering this market with an inexpensive, unproven product and any increase in lime costs will reduce the competitiveness of lime in this market.

**Response**

An increase in the price of lime relative to substitutes will tend to reduce the quantity of lime purchased. However, to the extent that liquid petroleum byproducts are marginally effective and unproven, they are presumably not close substitutes for lime.

**Comment**

One commenter (IV-D-06) claims that although EPA has indicated its rule will have larger impacts on small businesses than large ones, the disparity is even greater than EPA estimates. The reductions in pre-tax earnings presented in the EIA understate losses for small firms because the costs of implementation will be higher than EPA estimates and the price of lime will not increase. They also state that even if only 2 to 3 of the 14 small lime firms close, that would still be closure of 14% to 21% of the small lime firms in the domestic industry. This seems to be such a significant economic impact that it should encourage the EPA to seriously consider additional ways to minimize the impact on small businesses.

**Response**

It is unclear what the basis for the first part of this comment is (it seems the same claims they are making for small firms would also apply to large firms). As far as the second part, to the extent that actual costs differ from EPA estimates, it is possible that the actual losses experienced by firms would be higher or lower than presented in the EIA. However, the costs of implementation currently used for analysis reflect EPA's best estimate of actual costs. The assertion that lime prices cannot increase in response to an increase in production costs is not credible (see comments above).

We also disagree that the number of small firms at risk of closure, 2 to 3, can be considered a significant number in the context of SBAR. In any case, we have seriously considered ways to minimize the impact on small businesses based on comments from industry and has substantially reduced the costs of this rule relative to pervious versions. As previously discussed, EPA, along with the Small Business Administration and the Office of Management and Budget, convened a panel under the authority of SBAR to talk with small business representatives on how to mitigate potential impacts to small businesses associated with the lime manufacturing NESHAP. This panel yielded a report that included many recommendations on how potential impacts to small businesses from the proposed rulel could be mitigated. These recommendations are also reflected in the final rule.

**Comment**

One commenter (IV-D-06) claims that the EIA assumption that production costs will go down with decreases in production is wrong. The commenter claimed that they maintains a close watch on cost of production stated in cost per ton of lime produced. Simple economics dictates that an increase in dollar cost associated with a decrease in production results in a higher cost of production, which is a higher cost per ton of lime.

**Response**

Presumably, the commenter's statement that there is an increase in dollar cost refers to the compliance costs, but those costs are shown separately from production costs in the EIA. The EIA does not say that the total cost per ton of lime including compliance costs will decrease, it indicates that total production costs (not including compliance costs) will decrease in response to a reduction in use of variable inputs as production falls.

**Comment**

One commenter (IV-D-06) stated they are already trying to control costs while over the past several years our workers' compensation insurance, group health insurance, natural gas, maintenance parts, and liability insurance costs have continued to increase by double digit percentages, while sales prices have not increased to this extreme. Trade and economic predictions indicate more similar increases can be expected. These factors should be important considerations of the economic analysis.

**Response**

EPA gathered baseline data for the lime industry to inform the economic analysis. It is possible that market conditions for the lime industry have worsened over time. However, the focus of the economic analysis is the incremental impacts of the lime manufacturing MACT standard, which may be relatively small compared with other changes that are occurring within the lime industry.

## 3.12 Risk Analysis

**Comment**

One commenter (IV-D-01) was concerned over EPA's use of the Acute Exposure Guideline Level (AEGL) in assessing the health risk associated with HCl. While not directly objecting to the conclusions reached by EPA, the commenter noted that the intended use of the AEGL, according to the National Research Council, is in conjunction with "once in a lifetime" exposures for emergency exposures ranging from 10 minutes to 8 hours. Because the AEGL values are intended to be used in conjunction with a single lifetime exposure, they can be higher than short term limits recommended for populations with repeated exposures. It is not clear in the description of the NLA analysis, if NLA in their use of AEGL was contemplating a once in a lifetime exposure or whether exposures would be occurring repeatedly. The commenter stated that EPA should explicitly state how they believe AEGL values should be used in their risk assessment process and what are the possible exposure levels to the public. The commenter was also troubled by the use in the rationale of both the RfC (estimated daily exposure that over a lifetime is not likely to result in significant non cancer effect in humans) and the AEGL (once in a lifetime exposure).

The commenter asked that EPA clarify their position on the use of AEGL values for environmental risk assessments, and whether its use represents a "reasonable methodology" and "consistent with EPA methodology" as claimed in the preamble.

**Response**

This analysis evaluated only risks based on offsite exposure to the general population. EPA does not assess risks associated with occupational exposures, nor do we have the authority to address occupational issues.

In our evaluation of the NLA risk analysis, EPA reviewed the available acute dose-response values for this compound. Among these, the CalEPA reference exposure level (REL) and AEGL-1 values (2.1 and 2.7 mg/m$^3$, respectively) were found to be the most health-protective. Since these benchmarks were effectively the same, and AEGL values are products of a Federal effort in which EPA participates, we gave priority to the AEGL. Therefore, the AEGL-1 selected for analysis represented the most appropriate value.

Although there are relatively protective acute dose-response assessment values for hydrochloric acid, protective assessments for other hazardous air pollutants may not exist. In such cases we may have to rely on less-conservative analyses, perhaps based on endpoints at mild effect levels. Nevertheless, EPA believes that the use of less-protective values (e.g., AEGL-2) is better than omitting acute exposure from the risk assessment.

## 3.13 Applicability

**Comment**

One commenter (IV-D-03) requested that the rule be revised to exempt lime kilns operated in conjunction with public water treatment facilities. The commenter explained that the kilns are used to recover the calcium carbonate sludge from their water softening process. The recovered lime is used on-site in the water treatment process thereby reducing demand for these resources, avoiding the air emissions that would otherwise be associated with the transport of this material to a disposal site, and reducing the amount of solid waste generated. Under the existing language of the rule, the lime recovery kilns located at the water treatment plant would be subject to the rule because the treatment facility operates air stripping towers which are permitted to emit over 10 tons of a single HAP and over 25 tons per year of multiple HAP.

The commenter states that unlike lime kilns that process raw limestone materials, which contain metal HAP, the sludge from the water softening process, the only calcareous material fed to the kilns, does not contain metal HAP in any appreciable quantity. The elements and compounds found in the calcareous sludge from the water softening process are representative of those found in the treatment plants raw water source and the chemicals that are added as part of the water softening process. As the public's water supply, neither the source water, sodium silicate, nor the lime added prior to the kiln should have significant levels of metal HAP.

The commenter also stated that EPA did not review lime kilns at water treatment facilities in developing the proposed rule. Nor did the NLA include these lime kilns in their modeling of HCl emissions. The inclusion of lime kilns operated as part of water treatment facilities would be arbitrary and capricious and not based on any research or analysis.

The commenter suggests EPA revise 63.7081(a) to include public water treatment plants in the list of lime producing facilities exempt from the rule. The commenter also suggests revising 63.7143 by modifying the definition of "Stone feed" by adding the following: "Stone feed does not include calcareous solids that are generated by and recovered in the water softening process at water treatment plants."

#### Response

The lime recovery operation described by the commenter was not the intended target of the rule. The EPA has revised the rule to exclude lime kilns that are operated as part of a publicly owned water treatment facility to recover lime from water softening processes.

### 3.14 General Comments

#### Comment

One commenter (IV-D-16) notes that in the proposal preamble, EPA asked for comments on a two-tiered approach for compliance monitoring. The commenter agrees that the rule should contain a threshold limit to initiate corrective action (which if corrected within a given time period would not constitute a violation). In many cases, entering a baghouse to perform maintenance on a broken bag poses a significant hazard to the maintenance personnel due to temperature, lack of oxygen, and high levels of sulfur oxides and nitrogen oxides. Thus the time period for corrective action must consider the critical time necessary to cool down and purge a compartment, so that the danger to maintenance personnel can be minimized.

**Response**

For baghouses monitored using BLD systems and for ESP monitored using PM CEM, alarm systems may be used to alert operators when preset levels have been have been exceeded indicating that corrective actions may be necessary. Only after the alarm time has exceeded 5 percent of the total operating time in a 6-month period has a violation of an operating limit occurred. Alarm time is counted by how long it takes it takes from the onset of a BLD or PM CEM alarm to the time that corrective action is initiated. By not counting the time required to correct the problem, the plant owner or operator can take the time necessary to address the cause of the alarm in a safe and efficient manner without incurring additional alarm time. Procedures to be followed in inspecting control devices for the cause of alarms or malfunctions should be incorporated into a facility's OM&M plan and SSM plan.

For other parametric compliance monitoring options, the rule requires that the owner/operator define the compliance parameters to be monitored in their OM&M plan. During the initial performance tests, they are required to monitor and establish the value or range of the parameters. EPA believes that the initial performance tests will be designed to give the owner or operator flexibility in adhering to the established range for monitored parameters. These values must be reported in the results of the test and notification of compliance status to the permitting authority and must be approved by the permitting authority. During subsequent operations, if the monitored parameters exceed the values or fall outside the range determined during the initial performance test, it is a violation of the operating requirements of the standard (unless it is the result of a malfunction to which the facility responds to in accordance with the SSM plan). The EPA has no basis for allowing deviations before considering the facility to be in violation. The owner/operator has ample opportunity to establish a range for the operating parameters and must thereafter operate within that range.

**Comment**

Several commenters (IV-D-04, IV-D-05, and IV-D-08) believe the rule should not require HCl testing of all kilns. Commenter IV-D-04 believes the rule should provide state agencies with the discretion to not require HCl testing of all kilns. Commenters IV-D-05 Western and IV-D-08 Engineering believe the rule itself should allow flexibility in HCl testing.

The commenters note that in recent years, many lime plants have been forced to idle or infrequently operate kilns at operating plants due to increased fuel cost, reduced customer demand, etc., and start up of every kiln for the purpose of conducting HCl testing would require significant expenditures. Commenter IV-D-04 notes that this would also result in PM and other emissions that otherwise would not be generated. Commenter IV-D-04 uses the example of an idled kiln of the same type as an active kiln at the plant, fired with the same fuel and stone; it may be reasonable for a state agency to conclude that HCl emissions testing from the active kiln can be used to estimate emissions from the idled kiln. Furthermore, the commenters note that testing may not be warranted on kilns that represent small fractions of the plant's total capacity.

As a result, Commenter IV-D-04 requests that the rule be revised to provide state agencies with the discretion to determine whether testing of all kilns at a lime plant is necessary in order to demonstrate that a plant is an area source. Commenter IV-D-05 requests that the rule state that plants which desire to claim area source status be required to test a sufficient number of kilns so that 70 percent or more of the potential production capacity of the plant is tested for HCl. Or, as an alternative, EPA could allow HCl test results from one kiln to be extrapolated to estimate emissions from comparable kilns at the same plant.

**Response**

A lime manufacturing plant's status as an area source or a major source is not addressed by this rule. If there are questions regarding whether a source is an area source or a major source, the owner or operator should refer to the General Provisions, in particular, section 63.2, and contact the appropriate permitting authority if additional clarification is needed. We believe this is the best approach for major source determinations because every site may have different issues, and attempting to address these site specific issues in this rule would be inappropriate. We believe allowing the permitting authority to evaluate these issues on a case-by-case basis is the best approach.

**Comment**

Several commenters (IV-D-04, IV-D-17, IV-D-11, and IV-D-13) state that the rule should allow lime plants to use the following emission factors to estimate HAP metal emissions: 0.15 percent of PM emissions from kiln stacks and 0.07 percent from stone handling operations. Commenters IV-D-04 and IV-D-17 believe that the quantity of metal HAP emitted from lime plants is sufficiently low that it is highly unlikely that such metals will be present in quantities that would have any effect on whether a commercial lime plant exceeds the 25 ton per year major source threshold for all HAP. According to commenter IV-D-04, Docket Item No. II-B-43 establishes the HAP metal content of lime kiln emissions to be 0.15 percent, and Docket Item No. II-B-77 establishes the HAP metal content of fugitive stone emissions to be 0.07 percent. Commenter IV-D-16 Refractories also commented that the rule should allow for the use of emissions factors for HAP metals.

Commenter IV-D-04 notes that the cement MACT allows cement plants to assume that HAP metals emissions constitute 1 percent of PM emissions for the purpose of area source determinations. This commenter believes the quantities of metal HAP from lime plants are so small they will not affect the area/major source determination, and thus measurement of the metal emissions is unnecessary.

**Response**

The rule, as proposed, contained no requirement to measure HAP metals in the emissions from kilns or stone handling operations and we see no reason to add such provisions. The final rule does not require that lime manufacturing plants perform emissions testing for HAP metals. Therefore, we see no reason to establish a specific ratio in the rule. However, nothing in the rule would preclude these ratios from being used.

**Comment**

Several commenters (IV-D-04, IV-D-16, IV-D-11, and IV-D-13) comment that testing for HAP organics should not be required because it is highly unlikely that such compounds will be present in quantities that would have any effect on whether a commercial lime plant exceeds the 25 ton per year major source threshold for all HAP. Commenter IV-D-04 notes that lime kilns are not expected to emit significant quantities of organic HAP because inorganic limestone is the only feed material processed, and EPA's testing of 10 commercial lime kilns detected virtually no organic HAP (Docket Item No. II-B-121). This commenter also notes that lime kilns at sugar beet facilities have been exempted from the lime MACT, and no analysis of organic emissions from lime kilns at sugar beet facilities has been conducted (Docket Item Nos. II-B-44 and 81).

**Response**

EPA agrees with the commenters, the rule does not require that emission testing for HAP organics be conducted.

**Comment**

One commenter (IV-D-04) states the requirement in § 63.7142(b) to use FTIR, Method 18 or ASTM D6420-99 if organics testing is conducted for area source determinations should be deleted. The commenter notes that the proposed requirement creates the inference that organics testing should be conducted, and that testing beyond the 36 volatile organics specified in the ASTM method is necessary, when the chance that organics will cause lime plants to be a major source is highly remote.

**Response**

As stated in the previous response, the final rule does not require emission testing for HAP organics. However, we do not believe it is appropriate to specifically state that organics testing is not required. It is possible that a permitting authority may wish to have a facility perform organic HAP testing due to site specific considerations. If this occurs, we believe that EPA-approved test methods should be used.

**Comment**

One commenter (IV-D-02) believes the final rule should include an alternative limit based on the quantity of HAP metals released. For example, " a lime manufacturing plant with a dry collector and a particulate release greater than 0.12 lb/tsf should not be required to meet a MACT surrogate particulate value when its release of HAP metals is equal to or less than that of EPA's basis for establishing the 0.12 1b PM/tsf limit...a lime plant that has a stone feed stock low in heavy metals and/or fires with natural gas can have a lower HAP metals release than a plant meeting the proposed MACT particulate limit. Since the intent of the proposed regulation is to control the release of HAP metals, whether a company complies via operating practices or particulate control equipment should be irrelevant." In the case of wet scrubbers, the commenter recommends an alternative HAP limit of 1.5 lbs/1000 tons of stone feed (based on a particulate release of 1.0 lb/tsf and a HAP metals concentration of 1,500 ppm in the particulate).

**Response**

We do not have, and the commenter did not provide, sufficient HAP metal emission information on which to establish a metal HAP emission limit as an alternative to the PM emission limit. We commonly use PM emissions as a surrogate for metal HAP emissions, finding that controlling PM emissions will control the non-volatile and semi-volatile metal HAP. At-the-stack controls used at lime manufacturing plants, i.e., baghouses, ESPs, and wet scrubbers, capture non-volatile and semi-volatile metal HAP non-preferentially along with other PM, making PM a permissible indicator for HAP metals. We believe using PM as a surrogate is preferred by most sources as the cost of emissions testing and monitoring that would be required to demonstrate compliance with the otherwise numerous standards that would apply to individual HAP metals would be much higher than testing for and monitoring for PM emissions.

**Comment**

Several commenters (IV-D-04, IV-D-16, IV-D-11, and IV-D-13) state that performance testing should be conducted under "representative" conditions rather than under the "highest production level reasonably expected to occur." Commenter IV-D-11 notes that there are inconsistencies between what is proposed in Table 4 of the rule and what is required under the General Provisions at 40CFR 63.7(e)(1). EPA has recently amended the Cement MACT to fix similar inconsistencies, and the commenter suggests the Lime MACT be similarly revised.

**Response**

We have changed the requirement in the final rule to require testing under representative conditions, which is in agreement with the language in the General Provisions.

**Comment**

One commenter (IV-D-04) notes that reports should be required only for malfunctions, not startups and shutdowns. The commenter states that in recent proposed amendments to the General Provisions in Subpart A of Part 63, EPA has determined that requiring reporting of startups and shutdowns is “unnecessary and burdensome” (67 Fed. Reg. 72,881).

**Response**

Section 63.7121(b) requires that deviations from operating, VE, and opacity limits, including periods of startup, shutdown, or malfunction be reported. EPA intends for this requirement to be consistent with the General Provisions and has revised this paragraph to clarify that reports of startups, shutdowns, and malfunctions are to be made in accordance with section 63.10(d) of the General Provisions.

**Comment**

Two commenters (IV-D-04 and IV-D-16) believe the final rule should provide a risk-based exemption from the entire rule (not just from HCl standards) for plants at which modeled risks are below health based thresholds. Commenter IV-D-04 notes that EPA recently solicited comment on providing risk-based exemptions in proposed MACT standards for several sources categories. This commenter strongly supports the view that such exemptions should be provided in MACT standards that impose substantial costs while achieving negligible reductions in risks to public health, and believes the lime MACT fits this description.

**Response**

Other than the decision to not regulate emissions of HCl from lime manufacturing, EPA did not consider and did not request comments on providing risk-based exemptions for lime manufacturing facilities. Although EPA is aware that risk-based exemptions were being discussed in other proposed rules, no decisions have been made by the Agency regarding risk-based exemptions and application to industry groups or individual plants. Due to the uncertainty of how these exemptions would be structured, we do not believe that it would be appropriate to include these site specific risk based exemptions in the final rule. We also believe that including such a substantive change in the final rule without allowing the general public an opportunity to comment would be a violation of the Administrative Procedures Act, especially in light of the fact that their inclusion in other proposed rules have generated significant negative comment from the public.

**Comment**

One commenter (IV-D-04) states the Benefits Analysis is based on inaccurate assumptions, and presents conclusions regarding reductions in metal HAP that are greatly overstated.

The commenter submitted comments to the Small Business Advocacy Review (SBAR) Panel explaining that the emission factor for uncontrolled existing kilns is 27 times smaller than the emission factor used by EPA to calculate baseline emissions. The commenter notes that its emission factor is based on actual test data from these kilns.

The commenter also notes that the emission factor for existing uncontrolled stone handling operations is also overstated; it was derived using AP-42 emission factors with "E" ratings. The commenter states that it also presented to the SBAR Panel a more reliable emission factor for these units that is rated "C" and was revised in 1995.

In addition, the commenter claims that EPA overstated the amount of new capacity and the emissions from new rotary kilns. The commenter states, "EPA should either reflect (our) estimates in the preamble to the final rule, or provide a reasoned response to our comments that EPA's estimates are overstated...we believe the best estimate of metal HAP reductions is 3.5 tons (7,000 pounds) per year. Based on the 56 lime plants predicted to be subject to the MACT rule, this translates into an annual reduction in metal HAP per lime plant of 124 pounds.

**Response**

EPA reviewed the new information on PM emissions presented by the commenter as well as their calculations of baseline emissions and emission reductions resulting from the rule and finds them to be reasonable. The preamble to the final rule reflects these revised estimates. However, even with these revised estimates, we still note that the estimated benefits are still significantly higher than the costs for the final rule.

**Comment**

One commenter (IV-D-22) states that EPA should clarify that PM from nuisance dust collectors that service coolers are not included in the collective PM limit for kilns/coolers. The commenter notes that nuisance dust collectors, commonly associated with coolers, (called the cooler duct collector in some plants) collect dust generated in the transfer from the cooler to the material handling system, and PM from the nuisance dust collector should not be included in the kiln PM limit, but instead should be exempt as part of the lime handling system.

**Response**

The standard only applies to air used for cooling that is exhausted from the cooler to the kiln or that is exhausted separately to the atmosphere. Operations that process only lime product, lime kiln dust, or fuel are excluded from coverage. The rule was revised to clarify that dust emitted in the transfer from the cooler to the material handling system is not included in the calculation of the PM emission rate.

**Comment**

One commenter ( Docket No. OAR-2002-0052, item 530) states that clean air is essential, and requests that the companies that pollute the air be made to clean it up.

**Response**

EPA acknowledges the comment and believes this and other standards promulgated under the CAA are effective at reducing HAP emissions.

**Comment**

One commenter (IV-D-15) requests that EPA withdraw the proposed Lime manufacturing NESHAP and publish a new draft that is substantially more environmentally protective of PM10.

**Response**

The degree to which emissions of any substance can be reduced by regulation are a reflection of the statutory basis of those regulations. Under section 112 of the CAA, EPA is directed to establish MACT standards which are based on the emission reduction being achieved by the top performing, currently operating facilities. The standard for lime manufacturing plants used this approach and we believe that the result of the standard will be a substantial reduction in total PM emissions (over 3,880 tons per year), including PM10 emissions.